# PETROLEUM RESOURCE ASSESSMENT OF THE PEEL PLATEAU, YUKON TERRITORY, CANADA

National Energy Board
for Energy Resources Branch

November 2000
Whitehorse, Yukon

Yukon
Economic Development

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Oil and Gas Resources Branch
Department of Economic Development
Government of the Yukon
Box 2703
Whitehorse, Yukon Y1A 2C6
phone: 867-667-3427
fax: 867-393-6262
website: www.yukonoilandgas.com

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# FOREWORD

A study of the petroleum resources of the Yukon portion of the Peel Plateau was undertaken by the National Energy Board (NEB) in response to a request from the Government of Yukon. Assessment of petroleum resource potential is important for forming regulatory policies for these resources and for providing a basis for planning and issuing exploration rights.

# EXECUTIVE SUMMARY

For the past 22 years, the Peel Plateau area has remained inactive. Petroleum potential exists in the Carboniferous and Devonian carbonates. Conceptual stratigraphic and structural plays have been identified.

| | |
|---|---|
| **Basin Age** | Early Paleozoic to Cretaceous |
| **Basin Area in Yukon** | 10,288 km² |
| **Depth to Target Zones** | Mesozoic: surface to 632 m<br>Carboniferous: surface to 1,108 m<br>Devonian shale: surface to 1,899 m<br>Devonian carbonate: 1,358 m to 2,703 m |
| **Maximum Basin Thickness** | 4,000 m |
| **Hydrocarbon Traces** | Shell Peel River YT B-06 (gas to surface, too small to measure, gas-cut mud)<br>MCD GCO Northrup Taylor Lake YT K-15 ( gasy fresh water)<br>Pacific et al Peel YT F-37 (gasy muddy salt water)<br>Gulf Mobil Caribou YT N-25 (gas-cut mud)<br>Shell Peel River YT M-69 (gas to surface, too small to measure) |
| **First Discovery** | No discoveries |
| **Potential Resources** | Oil: Mean 3.38 $10^6$ $m^3$ ( 21.3 MM Bbls ) @ 35%<br>Gas: Mean 64,550 $10^6$ $m^3$ ( 2.29 Tcf ) @ 39% |
| **Basin Type** | Foreland basin overlying continental margin |
| **Depositional Setting** | Shallow- to deep-water carbonate and clastic shelf |
| **Potential Reservoirs** | Plain Area: carbonate reefs; deltaic clastic; disturbed belt: as above, fractured clastic and carbonate |
| **Regional Structure** | Contraction and extension fractures |
| **Seals** | Imperial; Canol; Hare Indian; Hume, Arctic Red and facies changes |
| **Source Rocks** | Canol; Hare Indian (Bluefish Member); Hume; Tuttle; Imperial; Arctic Red |
| **Depth to Oil/Gas Window** | not applicable |
| **Wells in Study Area** | 19 D&A |
| **Seismic Coverage** | appoximately 3,000 km |

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# INTRODUCTION

This study was undertaken on behalf of the Yukon Territorial Government as part of their ongoing energy resource management program by the National Energy Board of Canada with assistance from Greg Cave, Ken Drummond and Tim Bird. Jim Dixon of the Geological Survey of Canada contributed the section dealing with the Cretaceous. The objective of the study was to investigate the petroleum resource potential of the Peel Plateau area in the Yukon. A quantitative analysis was designed to give a numerical estimate of resources that have the potential to exist in the study area. In the absence of known pools and hydrocarbon shows, risk factors for play parametres are given and assumptions are stated with a range to indicate the level of confidence in the numbers.

The Peel Plateau area is bounded by two physiographic features, the Mackenzie Mountains to the south and the Richardson Mountains to the west. The area under consideration is located between latitudes 65°30'N and 67°N and longitudes 132°W and 136°W, and covers an area of 10,288 square kilometres (Figures 1 and 2). The eastern limit of the study area is the border between the Yukon Territory and the Northwest Territories and the western limit is the Trevor fault.

For the purpose of this play assessment, the Peel Plateau is divided into two broad geographic regions based on structural complexity: 1) a structural belt similar to the foothills plays of southern Alberta, and 2) a relatively unstructured plains region east to the territorial boundary.

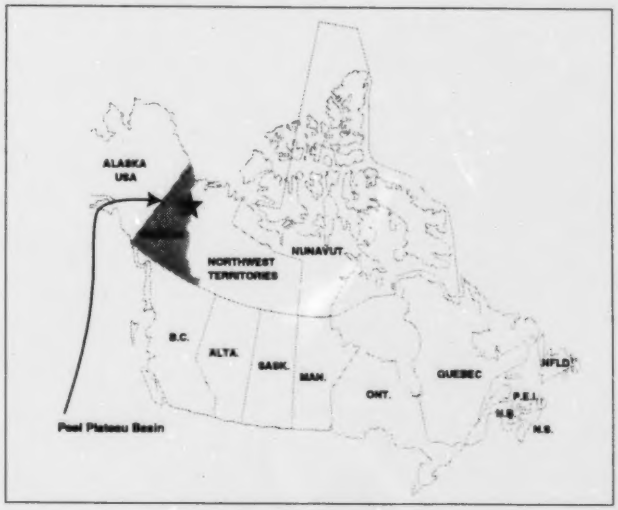



***Figure 1.*** *Peel Plateau location map.*

## ACKNOWLEDGMENTS

The NEB would like to especially acknowledge the previous work done at the Geological Survey of Canada, Calgary. Important work by J. Dixon, D. Norris, D. Pugh, L. Snowdon and others was key to completion of this project (see references).

## METHODOLOGY

The analysis of the hydrocarbon potential of the Peel Plateau study area began with documenting and synthesizing the regional geological setting as it relates to the basin evolution, geometry, sedimentation history, geochemistry, structural history and hydrocarbon occurrences within the study area. The results of this portion of the study were synthesized into a series of geologic illustrations and maps that show the geologic setting.

The objective was to analyze the Peel Plateau study area to provide background for the definition of models for possible hydrocarbon occurrences. Models for hydrocarbon entrapment (play types) were developed by examining hydrocarbon systems, and where possible, using analogous discovered reservoirs to extrapolate play parameters.

Geoscientific analysis was followed by systematic statistical analysis using a resource assessment methodology developed by the NEB. This methodology uses a series of templates, created in Microsoft Excel 97, combined with Pallisade Corporation's "@RISK" add-in set of programs. @RISK links directly to Excel and adds risk analysis and modeling capabilities to the Excel spreadsheet models.

The probabilistic methodology utilized in the templates was adapted from Roadifer (1979). A probabilistic estimate of the petroleum resources is achieved by multiplying independently randomly selected values from input distributions for hydrocarbon volume, hydrocarbon yield and risk using the following model:

**Hydrocarbon Volume x Yield x Risk = Undiscovered Resources**

A full description of this methodology was included in the NEB, *Natural Gas Resource Assessment, Northeast British Columbia*, released as a working paper in January 1994. This method has also been utilized by the NEB in the following resource assessment papers: *Petroleum Resources Assessment of the Liard Plateau, Yukon Territory, Canada* (November 1994), *Petroleum Resources Assessment of the Eagle Plain, Yukon Territory, Canada* (November 1994), *Natural Gas Resource Assessment of Southeast Yukon and Northwest Territories, Canada* (June 1996) and *Petroleum Resource Assessment of the Whitehorse Trough, Yukon Territory,* Canada (December, 1997).

## UNITS/ABBREVIATIONS

$10^6m^3$ - million cubic metres
ac-ft - acre feet
AOF - absolute open flow
Bbls - barrels
Bcf - billion cubic feet
BOE - barrels of oil equivalent
d - day
ft - feet
ft kb - feet below Kelly (drill platform)
GIP - gas in place
GOR - gas/oil ratio
Ha - hectares
IMG - marketable gas
km - kilometres
m - metres
md - millidarcies
mm - millimetres
mi - miles
mKb - metres below Kelly (drill platform)
MMbbls - million barrels
MMcf - million cubic feet
MMlt - million long tons
psi - pounds per square inch
Tcf - trillion cubic feet
$10^3$ - thousands
$10^6$ - millions
$10^9$ - billions

# REGIONAL GEOLOGICAL SETTING

The Peel Plateau area lies at the northwestern extension of the Western Canada Sedimentary Basin. Between latitudes 65°N and 68°N, longitudes 132°W and 136°W, the Peel Plateau area is bounded by two physiographic features: to the south, the Mackenzie Mountains and to the west, the Richardson Mountains. The study area is limited to the Yukon portion of the Peel Plateau.

The Peel Plateau area is underlain by a wedge of Tertiary and Cretaceous sediments deposited in a foreland basin setting that overlies, unconformably, a wedge of Paleozoic sediments deposited in a continental margin setting and preserved within the Peel Trough. The two sedimentary wedges dip westward and contain a succession of clastic and carbonate rocks. The stratig aphic section reaches a maximum cumulative sediment thickness of 4,000 metres.

Structuring associated with the Laramide orogenic event of the Paleozoic and younger geologic intervals affected these two sedimentary wedges within a 10 to 45 kilometre area fringing the east side of the Mackenzie and Richardson mountains. For this study, the last seismically defined subsurface fault to the east of the Trevor fault represents the eastern limit of the Peel Plateau. East of the disturbed belt, the sedimentary strata are relatively undisturbed and are preserved across a broad area. The plains area is located east of the disturbed belt out to the Yukon/Northwest Territories border (Figure 2).

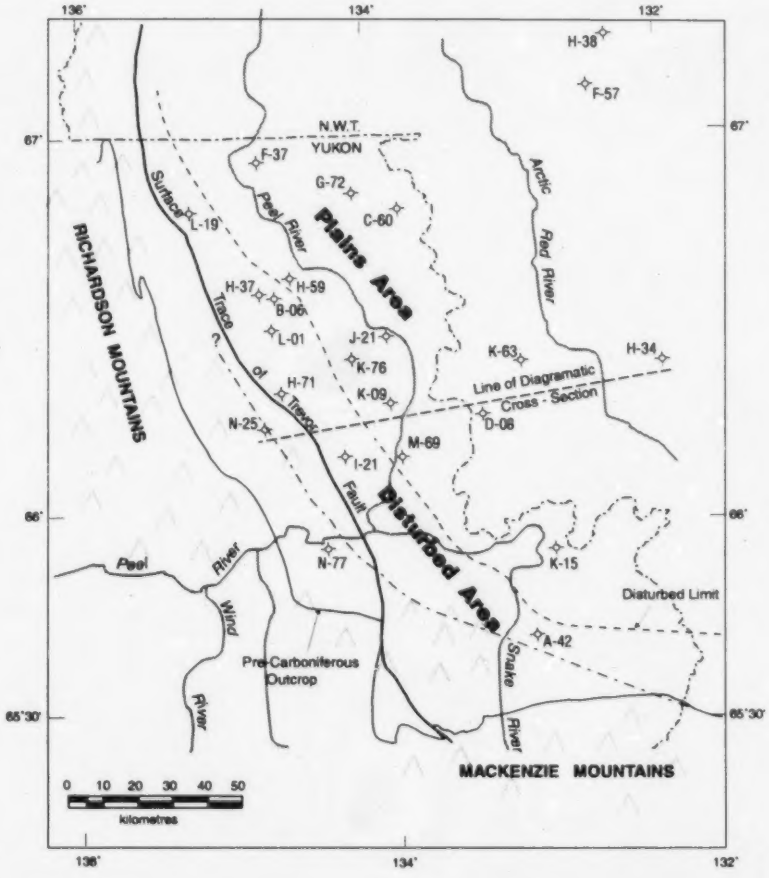



***Figure 2.*** *Peel Plateau area geological map.*

## STRATIGRAPHY AND DEPOSITIONAL SETTING

Within the Peel Plateau area, the Cambrian to Lower Cretaceous geologic section is represented. Figure 3 illustrates the stratigraphic nomenclature used in this study. The Cambrian Mount Clark, Mount Cap, Saline River and the Franklin Mountain formations overlie, unconformably, the deeply buried Proterozoic. Most deep wells terminate in the carbonates of the Upper Cambrian Franklin Mountain Formation and rarely is the entire Cambrian section penetrated. The Ordovician and Silurian are represented by the Mount Kindle and Peel formations respectively. The Devonian is composed of seven formations: the Tatsieta, the Arnica, the Landry, the Hume, the Hare Indian, the Canol and the Imperial. The Carboniferous Tuttle Formation is unconformably overlain by the Lower Cretaceous Martin House, Arctic Red and Trevor formations.

The Cambrian Upper Saline River and Franklin Mountain formations signal the early deposition of marine carbonate in a continental margin setting. This depositional setting prevails throughout the Ordovician, Silurian and Lower Devonian. A sedimentary change occurs during mid Devonian with the deposition of shallow to deep marine shales. The Upper Devonian Imperial Formation grades into the deltaic Carboniferous Tuttle Formation. Fluvial clastic sequences dominate the Lower Cretaceous Martin House Formation (Figures 3 and 4).

### Cambro-Ordovician

In most of the study area, the Lower Paleozoic section is either below economic drilling depth or interpreted to be too deeply buried and non-porous. Fractured and/or dolomitized carbonates could exist in these rocks, but risk factors for these reservoirs are too high to include in a numerical assessment. This is also true for an interpreted basal clastic section, which may exist in parts of the study area.

Major depositional regions for the Lower Paleozoic as outlined in Norris (1997) are the Mackenzie Platform and the Richardson Trough. The study area encompasses these features as well as a transition zone between them. This transition zone is the site of a major facies change, where there is a juxtaposition of deeper water organic shales to the west and dominantly carbonate ramp setting towards the east. This relationship persists through to the middle Devonian. (See discussion below). The deeper water or basinal shales of the Road River Formation occupy the western depocentre of this region. Towards the east, the erosional surface is interpreted to have remnants of a basal clastic unit, the Mount Clark Formation, overlain by Mount Cap Formation and Saline River shales or unconformably overlain by Franklin Mountain dolostones. The Late Cambrian to Early Ordovician Franklin Mountain Formation represents a thick carbonate platform section that is generally non-porous.

### Silurian to Lower Devonian

Dolomites of the Mount Kindle Formation unconformably overlie the Franklin Mountain Formation and are also thought to occupy a distal platform on a broad feature that correlates laterally with the Road River shale-out into the Richardson Trough. Another unconformity separates the Peel Formation which has its beginnings in the Upper Silurian, and similar to other units in this area, persists as a west-dipping carbonate platform with a lateral change to the Road River shales.

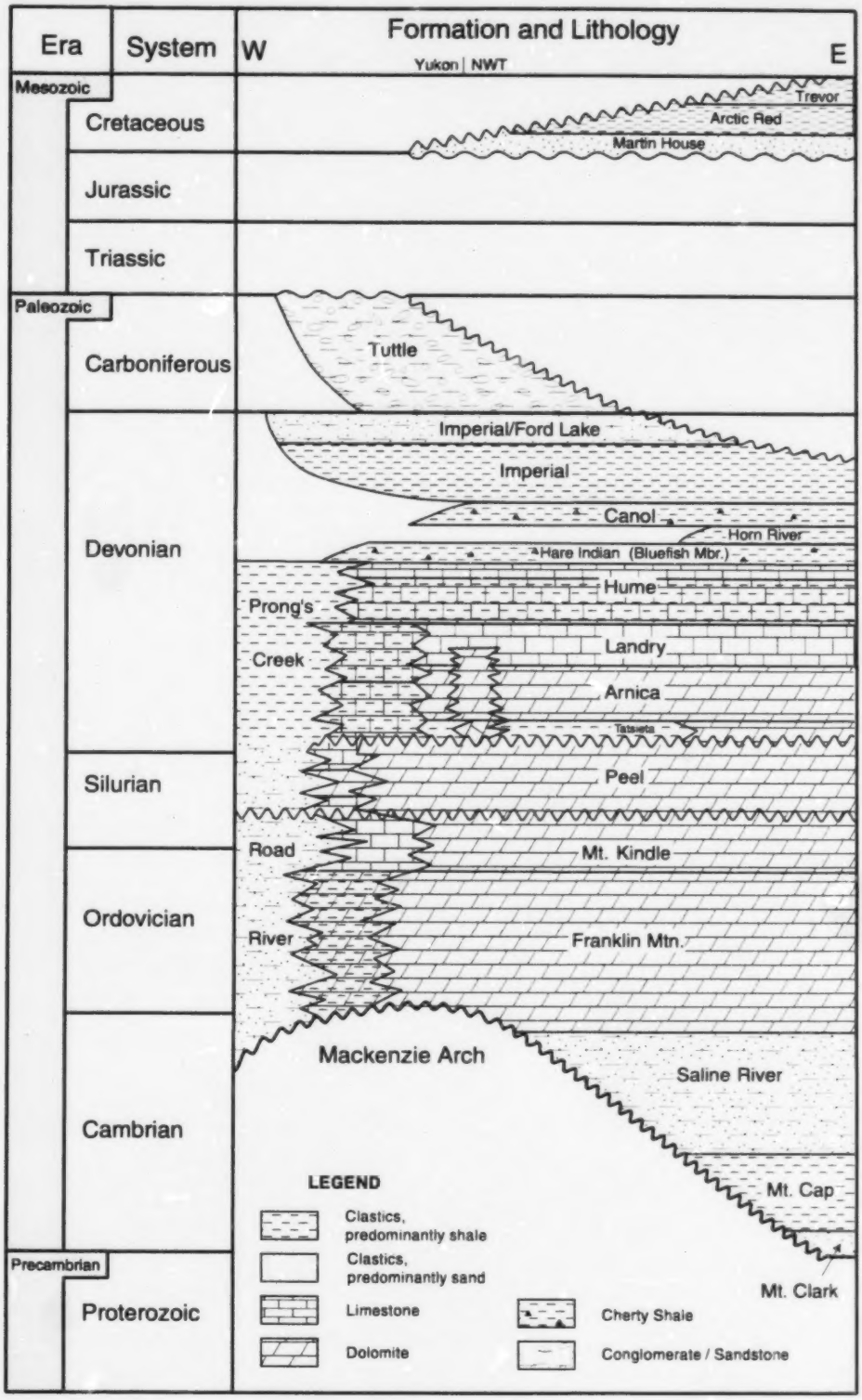



***Figure 3.*** *Stratigraphic column for the Peel Plateau area.*

## DEVONIAN

The carbonate-dominated system of the Western Canada Sedimentary Basin extends northwestwards into the Yukon Territory. The Devonian carbonates are widespread throughout the study area and consist of shallow to deep water sedimentation on the west-dipping Mackenzie platform.

### *Tatsieta Formation*

In areas where the Peel Formation is eroded, the Tatsieta Formation marks the basal Devonian section. The term was first proposed by Pugh (1983) for the unit deposited below the dolomites and above the Devonian unconformity. It is composed of thin green shale interbedded with shaley pale buff limestones. Minor dolomite is present in the upper part. Its thickness varies from zero at the edge of the Peel Basin to 83 metres to the west.

### *Arnica Formation*

The Arnica Formation lies conformably over the Tatsieta Formation. It is composed of an evaporite, limestone and dolomite succession. The gradation of dolomites to limestones occurs at the border of the Yukon and Northwest Territories. The dolomites of the Arnica are generally light to dark brown in colour, finely crystalline, and in part, sucrosic. High porosity was noted in this zone at the Shell Tree River F-57 in the Northwest Territories.

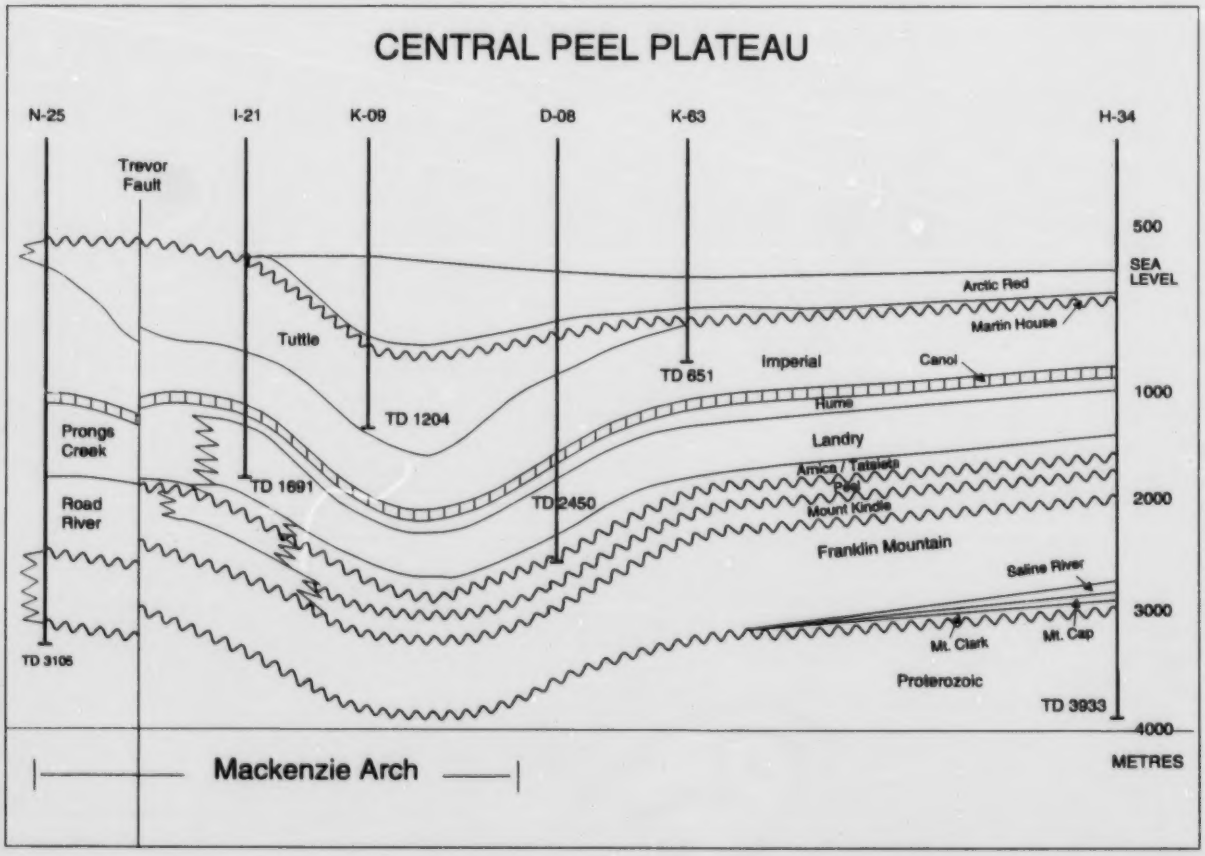



***Figure 4.*** *Geological cross-section for the Peel Plateau area*

#### *Landry Formation*

Douglas and Norris (1961) defined the Landry Formation. It is composed of very fine brown pelletoid limestone interbedded with the shaley overlying units.

#### *Hume Formation*

In 1961, Bassett first identified the Hume Formation exposed on the Hume River. This formation is shalier at the base and grades into cleaner carbonates in the upper part. The Hume Formation is composed of grey argillaceous limestones and calcareous shales. This formation contains abundant stromatoporoids, ostracods, crinoids and brachiopods. Its thickness ranges up to 150 metres on the west side of the area under consideration. The average total organic content is 1.9%.

#### *Hare Indian Formation*

Kindle and Bosworth (1921) first used the name Hare Indian. The formation is composed of micaceous and calcareous grey shales interbedded with argillaceous limestones. Plant fragments and bivalves are found in this interval. The bituminous basal limestones are interbedded with organic rich black shales likely deposited in an euxinic environment. This unit is commonly referred as the Bluefish Member and is a potential source rock. The upper part of the Hare Indian Formation consists of limestone beds grading from packstones to wackestones. Within the wackestones, stromatoporoids, corals, brachiopods and crinoids are common. The average total organic content is 2.9%.

#### *Canol Formation*

In 1961, Basset first proposed the term Canol. The Canol Formation is composed of a organic rich, partly siliceous and pyritic black shale. The Canol shales are believed to have been deposited in a restricted environment under anaerobic conditions. The shale is readily distinguishable on logs. The Canol Formation is a primary source rock and is known to have sourced the hydrocarbons found in the Kee Scarp reef complex at Norman Wells. The Canol Formation thickness reaches 157 metres to the northeast of the study area and the source rock reaches an average total organic content of 3.73%. While drilling, a gas kick was encountered at IOE Tree River H-38 well in the Northwest Territories.

#### *Imperial Formation*

The Imperial Formation is composed of siltstones and shales with minor fine-grained sandstones. Imperial Formation shale is believed to have been deposited in a marine environment as marine fossils are common. Towards the top of the Imperial Formation, coarser clastic units are found. On seismic, prograding sequences indicate a northeasterly source.

### CARBONIFEROUS

#### *Tuttle Formation*

The Tuttle Formation name was originated by D.K. Norris and formalized by Pugh in GSC Memoir 401. They applied the name to the Late Devonian to Mississippian section of conglomeratic to fine-grained clastics found between the Devonian Imperial Formation and the overlying Mesozoic sands and shales in the region around the Richardson Mountains. The Tuttle Formation is found on the east, north and west flanks

of the Richardson Anticlinorium, between 65°N and 67°30'N; and 131°W and 139°W. The name was derived from "Tuttle Hill" where the Tuttle Formation is located in outcrop on the west side of the Richardson Mountains. The type section is located in the Pacific Peel YT F-37 well.

The Tuttle Formation is part of a composite clastic wedge depositional system beginning with the Imperial Formation. The maximum thickness of the Tuttle Formation is about 1,100 metres on the east side and 1,420 metres on the west side of the Richardson Mountains (Pugh, 1983). A northwest-trending depo-center was likely located in the region of the Richardson Anticlinorium and was subsequently uplifted and eroded. The Tuttle Formation subcrops around the western, northern and eastern extent. Also, it outcrops along the western and eastern uplift edges of the Richardson Mountains. The lower Tuttle contact with the underlying Imperial appears to be conformable, but diachronous, and likely inter-tongues with the Imperial. The upper contact of the Tuttle with Lower Cretaceous strata shows evidence of pre-Mesozoic erosion, except in the southwest region where it is conformable and becomes part of the facies boundary with the Ford Lake shale. In general, the Tuttle is distinguished from the overlying Cretaceous sands by the absence of both glauconite and well-sorted quartzose sands.

Repeated cycles of fine- to coarse-grained fluvio-deltaic sandstones and conglomerates with intervening shales make up the Tuttle section. Tuttle sandstones are generally poorly sorted, with argillaceous matrix, kaolinite pore infilling and quartz overgrowths resulting in low porosities and permeabilities. Sorting and potential reservoir quality improve to the south where fine- to medium-grained sandstones are better sorted, more quartzose and less kaolinitic. Minor coal is present locally and scattered terrestrial plant remains are preserved. Hundreds of metres of shale exist in the section and may be inter-fingerings with the Ford Lake Formation shale. These shales may provide seals for discontinuous sand bodies in the Tuttle.

Many channel-like sand bodies are observed on well logs and in samples. They exhibit abrupt base contacts and consist of conglomerate, conglomeratic sandstone, grading upward into argillaceous sandstone. Coarsening-upwards sequences of shale grading upward into siltstone and sandstone are commonly found, particularly in the southwest. Sequences of this type develop in several environments including shoreline, delta-front, and slope. Sequences similar to those in the subsurface are found in the outcrop belt. The upper Tuttle becomes finer grained as it passes upward and southwestward into marine shale and siltstone of the Ford Lake Formation.

Pugh (1983) notes and maps the grain size distribution from coarsest in the northern region of the Peel River region in the vicinity of the type well Pacific et al Peel YT F-37 and Shell Peel River YT L-19 to finer in the south. Pebble and larger clasts found in the north trend to better-sorted and finer-grained sands and finally silts in the south. The Tuttle eventually shales-out to the southwest and becomes part of the Ford Lake Formation.

The Ford Lake Formation consists of thick black basinal shales, which are in part, interbedded and intertongued with Tuttle sandstones. These black shales may contain sufficient total organic content to form and expel hydrocarbons into the Tuttle sands.

Both structural and stratigraphic traps are possible in the Tuttle. The deeply buried, folded and faulted Tuttle may trap gas in the narrow disturbed area paralleling the Richardson Mountains, or gas may be trapped in channel or thin sand pinch-outs up-dip from the basin axis.

There is significant potential for good traps and seals in the Tuttle sandstones. However the greatest risk is the likelihood of fresh water flushing of the reservoirs due to proximity of outcrop belt and subcrop belt with overlying thief sands in the Martin House Formation. The Tuttle Formation tested gas to surface, too small to measure, in both Shell Peel River YT M-69 and Shell Peel River YT B-06, and recovered gas-cut water in Shell Peel River YT B-06A. Similar sediments in Eagle Plains have yielded significant recoveries of oil and gas.

## CRETACEOUS

Underlying most of the area are Upper Aptian to Upper Cretaceous strata of the Martin House, Arctic Red and Trevor formations. For a complete summary of Cretaceous zones, the reader is referred to Dixon, in press, and Dixon, 1992.

### *Martin House Formation*

Originally defined by Mountjoy and Chamney (1969) from near the junction of Peel and Snake rivers, Martin House Formation was subsequently mapped or identified as far north as Stony Creek (Norris, 1981; Dixon, 1992, p. 41). Within most of the wells on Peel Plateau and Plain that penetrate a Cretaceous succession, there is a thin basal succession of interbedded siltstone, shale and sandstone of the Martin House Formation. Martin House strata rest unconformably on Paleozoic rocks throughout most of its area of occurrence, although in the northwestern-most Peel Plateau, north of Dempster Highway, it abruptly overlies the Barremian to Lower Aptian Rat River Formation.

Mountjoy and Chamney (1969) recognized two informal members in the type area, a Basal Siltstone member and an overlying Glauconite member. These members have not been recognized from subsurface data. Mountjoy and Chamney also speculated on the presence of local conglomerates at the base of the Martin House Formation, based upon poorly dated outcrops and comparison with other areas. The known regional geology and the few dated occurrences (Jeletzky, 1974, p. 6) of these conglomerates strongly favour them being either part of the Upper Devonian Imperial Formation or the Lower Mississippian Tuttle Formation.

In the subsurface, the Martin House Formation generally consists of a basal sandstone-rich interval abruptly overlain by thinly interbedded siltstone, sandstone, and shale. This two-fold division commonly is reflected in the response of the geophysical logs, although the basal sandstone is not always identified. Thin beds of very fine- to fine-grained sandstone are present in the upper interval. In the basal interval, thick to very thick beds of fine- to medium-grained sandstone and, locally, thin beds of pebbly sandstone are present.

Martin House strata generally are less than 100 metres thick, with the thickest sections adjacent to the eastern flank of the Richardson Mountains, thinning to the north and east. Available thickness data suggest that there was a thick lobe extending northeast from the southern Richardson Mountains, 146.4 metres in Peel River YT M-69, 158.5 metres in Peel River YT L-01, and a less well defined lobe of Martin House strata in the vicinity of the Cranswick A-22.

The stratigraphic position of Martin House strata indicates deposition during a transgressive phase of sedimentation, the bulk of which occurred in a shallow-water, marine shelf. This is indicated by the presence of cross-bedded (commonly hummocky cross-stratified) and bioturbated sandy beds interbedded with silty shale, and the common occurrence of bivalve coquinas.

### *Arctic Red Formation*

Mountjoy and Chamney (1969) defined and named the Albian Arctic Red Formation, with its type area in the vicinity of the confluence of Snake, Peel and Arctic Red rivers. Arctic Red strata covers a large area of the Peel Plateau and Peel Plain. It is a shale-dominant succession between 350 metres and 400 metres thick at its type section, but is greater than 1,500 metres thick in the Arctic Red F-47 well in the south-central part of Peel Plateau.

Mountjoy and Chamney (1969) subdivided the Arctic Red into a number of informal local members based on the variation in the content of ironstone concretions and silty shale. In the subsurface there are some locally identifiable and, in some cases, correlatable log responses, but it is difficult to relate these to the members recognized by Mountjoy and Chamney. The fissile, silty to sandy shales are dark-grey to black, locally weathering brownish grey. Thin beds of bentonite are scattered throughout the formation. In general, the silt and sand content increases upwards, heralding the sandy character of the gradational overlying Trevor Formation.

The presence of marine faunas, prograding clinoforms, and predominance of shale indicate a relatively low-energy, marine shelf setting. The regional setting (Dixon, 1986, 1992, in press) indicates that the Arctic Red Formation of the Peel Plateau and Peel Plain was in a foredeep and in close proximity to the source terrain. This setting suggests the clinoforms in the Arctic Red succession may have been produced by delta progradation, rather than as continental slope clinoforms.

### *Trevor Formation*

The Upper Albian to Upper Cretaceous Trevor Formation was named and described from the Trevor Range, along the southwest margin of Peel Plateau, by Mountjoy and Chamney (1969). It extends eastward along the southern edge of Peel Plateau as far as Hume River (Yorath and Cook, 1981) in the Northwest Territories.

Trevor strata consist of fine- to coarse-grained, locally conglomeratic, sandstone interbedded with shale. The Trevor Formation gradationally overlies Arctic Red strata and it is probable that the base of the formation rises stratigraphically from south-to-north.

No wells in the Yukon have penetrated the Trevor Formation; only in the Actic Red F-47 of the NWT have Trevor strata been drilled. There the succession consists a series of coarsening-upward cycles. In the type area there is about 360 metres of Trevor strata (Montjoy and Chamney, 1969), increasing eastward to 602 metres in the Arctic Red F-47 well.

The age of the Trevor Formation is poorly constrained but the available data indicates a Late Albian to Late Cretaceous age, possibly as young as Turonian (Yorath and Cook, 1981; Aitken et al., 1982). Dixon (in press) argued for a major unconformity within the Trevor Formation.

Detailed sedimentological analyses of the Trevor Formation are lacking due to inadequate data.

## STRUCTURAL GEOLOGY

The map area (Figure 5) is dominated by two structural expressions, the east-west trending Mackenzie Mountains and the north-south trending Richardson Mountains.

The Early to Late Cretaceous Columbian Orogeny which originated the Mackenzie fold belt, terminates at the Richardson anticlinorium. It trends east-west and is dominated by en echelon fold bundles. The folds overlap each other and the structural style is dominated by strike-slip or oblique-slip faults (Norris, 1996, p. 27).

The Richardson Mountains comprise a gently north-plunging anticlinorial feature which divides the intermontane basins and the synclinal basin west of the craton. The anticlinorium is bounded to the east by the Trevor fault. The Late Cretaceous to Middle Eocene Laramide Orogeny resulted in normal faulting of the Richardson Mountains. The faults are almost vertical and trend north-south.

The last fault observed in the subsurface to the east of the Trevor fault represents the eastern limit of the Peel Plateau disturbed belt.

Laramide thrust faulting has left a compressional overprint on earlier Paleozoic normal faulting. Numerous strike-slip faults produce structural highs and lows in the Paleozoic section and appear as flower structures on seismic sections throughout the disturbed belt. These structures have vertical closure of up to 400 metres. Remnant Paleozoic features with 100 metres of vertical closure are present in the plains region to the east.

The disturbed belt in the Peel area offers a diversity of structural traps similar to the foothills of Alberta and British Columbia.

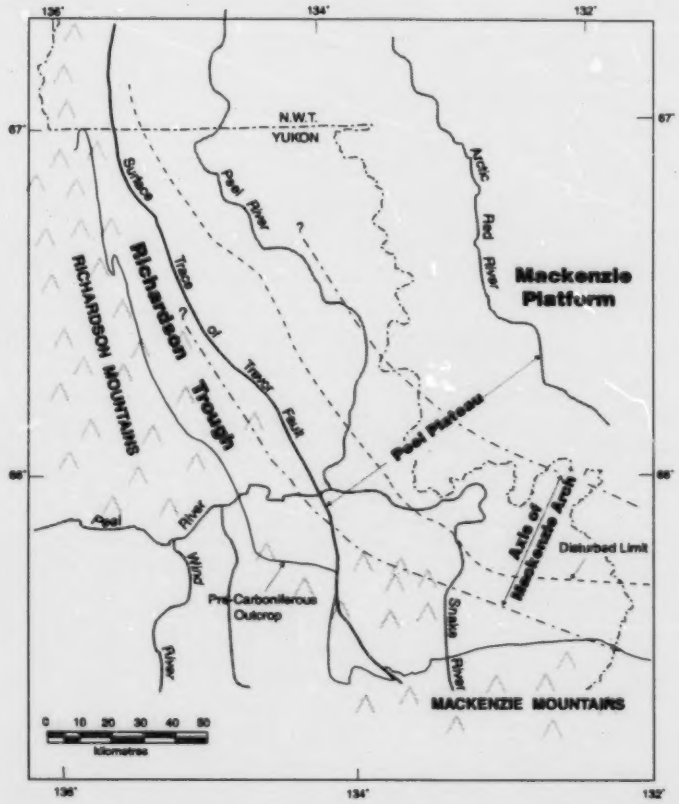



***Figure 5.*** *Physiographic features of the Peel Plateau area.*

## REGIONAL GEOCHEMISTRY

Source rocks that have been identified in the Peel Basin area are: Canol, Hare Indian (Bluefish Member), Hume, Tuttle, Imperial and Arctic Red formations. The most important source rocks and their total organic content (TOC) are summarized in Table 1 and published in Exploration Geosciences (1993).

***Table 1.*** *After Exploration Geosciences Ltd., 1993*

| Stratigraphic units | % TOC Average | % TOC Maximum | % TOC Minimum | % TOC Standard dev. | No. of units Samples |
|---|---|---|---|---|---|
| **Arctic Red** | 1.17 | 1.61 | 0.57 | 0.23 | 27 |
| **Tuttle** | 1.79 | 5.15 | 0.74 | 1.05 | 24 |
| **Imperial** | 1.19 | 3.87 | 0.25 | 0.74 | 162 |
| **Canol** | 3.73 | 6.95 | 0.76 | 1.45 | 70 |
| **Hare Indian** | 2.90 | 6.40 | 0.34 | 1.68 | 18 |
| **Hume** | 1.92 | 4.11 | 0.01 | 1.21 | 24 |

# PETROLEUM GEOLOGY

## EXPLORATION HISTORY

The Peel Plateau area surface exploration started in the mid 1950s. This exploration program was followed by one well (Shell Peel River YT J-21, rig released September 1965) which was dry and abandoned. Eighteen additional wells followed between 1965 and 1977 for a total of 42,319 metres. The most active exploration years were 1966 and 1967. A total of approximately $33 million was spent on drilling. Shell Petroleum drilled ten wells and was the most active operator from 1965 until 1974.

## SEISMIC COVERAGE

### Available Seismic Data

During the period from the mid-sixties until the mid-seventies, approximately 6,000 kilometres of seismic data were acquired in the Yukon portion of the Peel Basin, including the area adjacent to the Yukon/Northwest Territories border. In the information files of the National Energy Board, 500 kilometres of this data is available to the public in microfiche and hard copy form. These surveys lie within the disturbed belt and vary from fair to good quality.

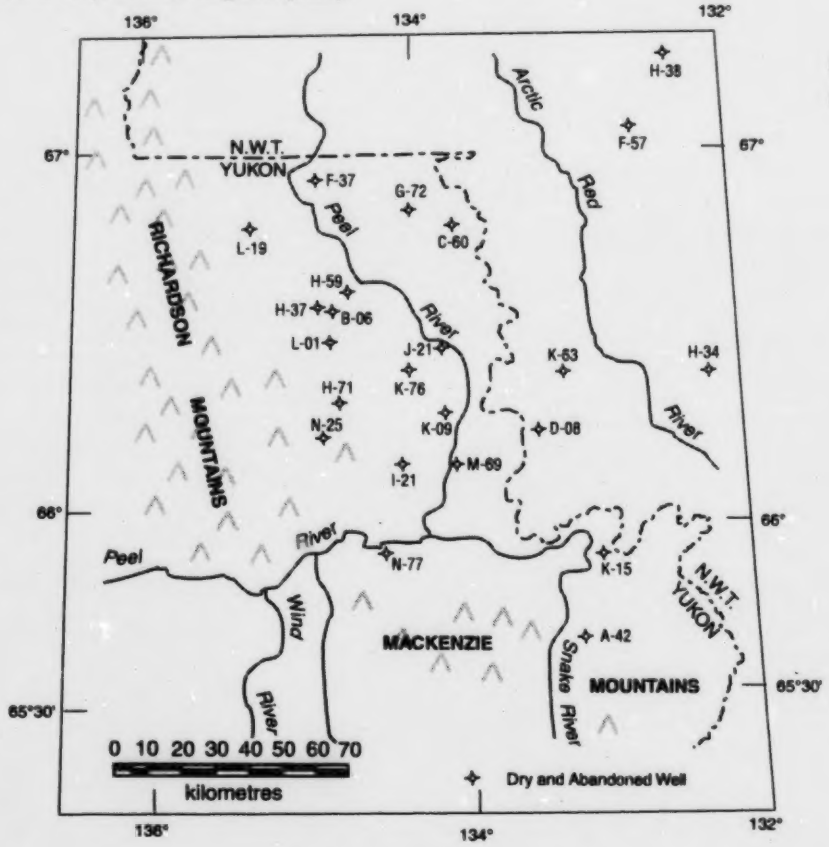



***Figure 6.*** *Wells drilled in the Peel Plateau area.*

## Seismic Examples

Three seismic lines (Figures 8a, 8b and 8c, included at the end of the report) are given as examples from the Mobil 1976 program over the disturbed belt. These lines were selected to demonstrate the structural geology and to indicate anomalous features. The northern-most example, (Figure 8a), dip line 5J-26, has been tied down to the Imperial event, to the Peel River YT L-01 well 3 kilometres to the east, and for events below the Imperial, to the Trail River H-37 well 13 kilometres to the north. Further south, dip line 5J-30 (Figure 8b) crosses the Peel YT H-71 well, which drilled into the Franklin Mountain Formation dolomite. Seismic correlation of the Proterozoic event was based on the Caribou YT N-25 well 12 kilometres to the southwest. The last example (Figure 8c), is dip line 5J-32, five kilometres south of the Peel River YT I-21 well, from its eastern end. Since this last well terminated in the Imperial Formation, seismic correlation was established by regional wells, Caribou YT N-25 and Peel River YT M-69, the latter which reached Peel Formation dolomites of Silurian age.

### *Ordovician*

Normal faulting occurred at the end of the Ordovician as indicated by the fault terminations at the Mt. Kindle event. The north-south Trevor fault is evident at the western end of line 5J-32 and is interpreted to have a strike-slip component that has created, along with parallel faults to the east, flower structures throughout this region of the Peel Basin. The fault to the east of Peel YT H-71 on line 5J-30 is one such example of parallel faulting and defines the eastern limit of the disturbed belt (Figure 8b). Strike-slip faulting on a smaller scale is evident on line 5J-26 (Figure 8a). Of interest on this last line is the anomaly in blue, within the Mt. Kindle Formation, which may be the result of compression fracturing or may represent a tongue within the carbonate system. Some reactivation of the Ordovician normal faults likely occurred during Laramide deformation.

The Ordovician-Silurian carbonate to shale facies change occurs at the Road River shale-out. This edge is located on seismic line 5J-32 at the boundary defined by the carbonate ramp (pink), just to the east of the Trevor fault (Figure 8c). Clastic progradation occurs westward beyond the carbonate platform.

### *Lower Devonian*

The Landry and Arnica formations of the lower Devonian show a carbonate to shale transition from the Peel River YT M-69 well, northward to Peel YT H-71, and westward to Caribou YT N-25. On seismic line 5J-32, the argillaceous limestones in the Peel River YT I-21 well are indicated by strong events within the sequence, in contrast to the homogeneous seismic character on line 5J-30 through the Peel YT H-71 well (Figures 8b and 8c). Two anomalies, shown in blue on line 5J-32, may indicate Arnica reefal build-ups that could exist on the margin of the Road River basin. These anomalies are approximately one kilometre in width. A potential hydrocarbon trap also exists within the Landry as a build-up on a carbonate ramp, although none were noted on seismic.

### *Middle Devonian*

A Middle Devonian carbonate to shale transition also occurs at the Road River facies transition. The Hume Formation, which is largely an argillaceous limestone in Peel River YT I-21, becomes a Hume equivalent shale in the Caribou YT N-25 well. Potential hydrocarbon traps could exist either within a reefal build-up on the Devonian carbonate platform or in more porous zones within the carbonate sequence. On seismic line 5J-32,

a Middle Devonian carbonate sequence is defined by reflection terminations (red). This is interpreted to be a shale/carbonate sequence that is truncated at the Hume unconformity marker, (blue-green) (Figure 8c).

The seismic response for the Canol shale to Hume interface is dependent on Hume lithology. A stronger seismic response occurs where the Hume is limestone or argillaceous limestone as indicated by the strong event on line 5J-32 compared to its lower amplitude on line 5J-30 (Figures 8b and 8c).

***Tuttle Formation***

In the Peel River YT L-01 well, there are intervals of sand with up to 20% porosity. Similar zones were identified in the Peel YT F-37 well to the north and in the Peel River YT J-21 and Peel YT H-71 wells to the south. A strong seismic response would be produced from these thin sands interbedded with shale and siltstone. It has been interpreted that the series of high amplitude reflectors just above the Devonian-Carboniferous Imperial marker correlate to the high porosity, coarse-grained, fluvio-deltaic sandstone units of the Tuttle Formation. Similarly, to the south, porous Tuttle sands were found in the Peel River YT L-21 well and a similar response was observed on seismic line 5J-32 (Figure 8c). Potential hydrocarbon traps may be present, within the Tuttle, on localized highs, up-dip along the north-south thrust faults, or stratigraphically trapped within shale.

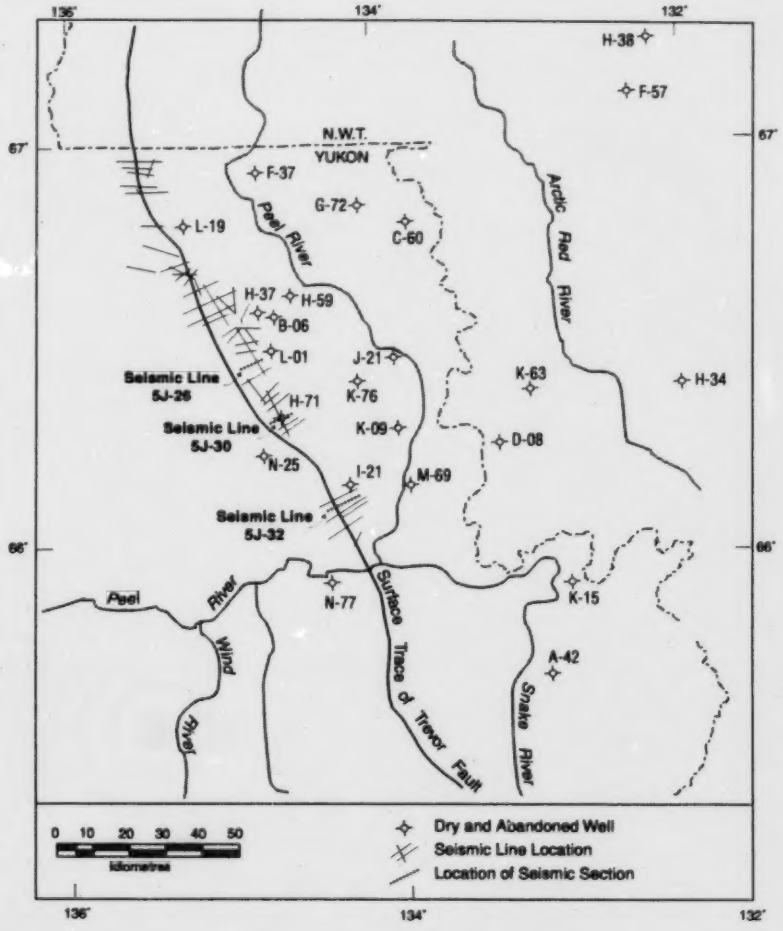



***Figure 7.*** *Seismic map*

# POTENTIAL RESOURCES

## PETROLEUM PLAYS

Since there are no producing zones in the study area, there are no immature or mature plays treated as part of this assessment. Six conceptual plays were analyzed in this assessment of potential resources. The plays are defined on the basis of structural complexity and lithology.

The structurally disturbed belt of the Peel Plateau offers a wide range of exploration targets. The carbonate interval from Upper Cambrian to Middle Devonian can be prospective for fractured dolomite and limestone reservoirs. Thirty-nine structures have been identified along the fairway, of which 33 are of a thrusted nature and six are of an anticlinal nature.

Plays assessed in the Plains area are mainly stratigraphic in nature. Some minor structural closure could occur.

## PLAY SHEETS

A play sheet was prepared for each play. Each play sheet provides a reservoir description for that play and a discussion of the undiscovered potential. Following the play sheet is the @Risk data input and output sheets.

# DISTURBED BELT
# PALEOZOIC AND CRETACEOUS CLASTICS

### *Reservoir description*

This play type includes Paleozoic and Cretaceous clastic units in a structural setting.

The Cretaceous clastics are considered a higher risk exploration play due to their generally thin isopach, proximity to the surface and low thermal maturity. The Martin House Formation is treated as the main Cretaceous zone considered to have reservoir potential. Sandstone horizons within the Arctic Red Formation could have reservoir potential, and for the purposes of this assessment are included in this play.

The coarse clastics of the Trevor Formation are essentially at surface in the Yukon, are of limited distribution and are subject to freshwater invasion.

Martin House sandstones have a tendency to be thin-bedded and argillaceous, although porous. A basal sandstone could be developed. However, like the Trevor Formation, proximity to the surface and deep dissection by river valleys may have allowed freshwater invasion.

Trap types would be most likely broad, low-amplitude anticlines associated with the Laramide Orogeny.

The Carboniferous section consists of repeated cycles of discontinuous conglomerates and sands, interbedded with shale and siltstone. The Tuttle Formation subcrops to the northeast, immediately east of the Yukon/Northwest Territories border. It outcrops to the west along the uplift of the Richardson Mountains, and undergoes a facies change to the southwest, pinching out into the Imperial and Ford Lake shale. The Tuttle Formation exhibits a maximum thickness of 1,198 metres, and a maximum net sand thickness of 236 metres in the subsurface to the east of the Richardson Mountains.

The reservoir rock consists of a mixture of conglomerate and poor quality sandstones, interbedded with siltstones and shales, deposited in a fluvio-deltaic environment. The Tuttle reservoir sands and conglomerates are largely poorly sorted with kaolinitic matrix, and exhibit generally poor porosities and permeabilities. Reservoir quality appears to improve to the south.

Trapping potential exists where the coarse clastics are uplifted, particularly in the faulted, deeper section of the Tuttle clastic wedge.

Bitumen plugging is commonly found in the Tuttle. Minor gas shows are found in Shell Peel River YT B-06 and Shell Peel River YT M-69, which drillstem tested gas to surface, too small to measure. No significant Tuttle Formation hydrocarbon shows have been found on the east side of the Richardson Mountains, however numerous recoveries of gas and oil occur in the Eagle Plain area to the west of the Richardson Mountains.

The greatest risk with the Tuttle conceptual play is the likelihood of freshwater flushing of the reservoirs due to proximity to the outcrop. Further, the overlying Cretaceous sand of the Martin House Formation could act as a thief zone above the Tuttle subcrop trend.

### *Potential resources*

The play is mainly a gas play, although some oil could occur. The assessment indicates that within a 90% probability range, there is a marketable gas potential of 3.1 to 15.1 billion cubic metres (111 to 571 Bcf) and a recoverable oil potential of 0.04 to 0.57 million cubic metres (0.3 to 3.6 MMB). Mean marketable gas is estimated to be 7.9 billion cubic metres (281 Bcf) at 42.5% probability. Mean recoverable oil is 0.22 million cubic metres (1.38 MMB) at a probability of 36.6%.

| | Minimum | Most likely | Maximum | Mean |
|---|---|---|---|---|
| Total play area (MM Hectares) | 0.400 | 0.413 | 0.435 | 0.416 |
| Tested play area (MM Hectares) | 0.004 | 0.004 | 0.004 | 0.004 |
| Untested play area (MM Hectares) | 0.396 | 0.409 | 0.431 | 0.412 |
| Fraction of total play area in trap | 0.100 | 0.200 | 0.300 | 0.200 |
| Fraction of untested area filled (areally) | 0.400 | 0.500 | 0.600 | 0.500 |
| Potential hydrocarbon area (MM hectares) | | | | 0.041 |
| Porosity | 0.090 | 0.130 | 0.180 | 0.133 |
| Hydrocarbon saturation | 0.500 | 0.700 | 0.850 | 0.683 |
| Oil recovery factor | 0.010 | 0.030 | 0.100 | 0.047 |
| Gas recovery factor | 0.550 | 0.650 | 0.750 | 0.650 |
| Average net pay (metres) | 15.0 | 30.0 | 45.0 | 30.0 |
| Probability of hydrocarbons | 0.040 | 0.100 | 0.170 | 0.103 |
| Fraction of pore volume oil bearing | 0.010 | 0.030 | 0.100 | 0.047 |
| Potential oil area (MM hectares) | | | | 0.000 |
| Potential gas area (MM hectares) | | | | 0.004 |
| GOR ($10^3m^3/m^3$) | 49.7 | 52.4 | 55.0 | 52.4 |
| Formation volume factor (FVF) | 1.110 | 1.168 | 1.227 | 1.168 |
| Gas compressibility factor 'Z' | 0.784 | 0.800 | 0.816 | 0.800 |
| Gas volume factor ($10^3m^3/m^3$) | | | | 0.116 |
| Oil in place ($m^3$/ha-m) | | | | 779.851 |
| Oil recovery ($m^3$/ha-m) | | | | 36.393 |
| Gas in place ($m^3$/ha-m) | | | | 105.481 |
| Raw gas recovery ($10^3m^3$/ha-m) | | | | 68.563 |
| Marketable gas recovery ($10^3m^3$/ha-m) | | | | 64.367 |
| Liquids yield ($m^3/10^6m^3$) | 12.000 | 15.900 | 19.900 | 15.933 |
| $H_2S$ content (frac) | 0.000 | 0.000 | 0.000 | 0.000 |
| $CO_2$ content (frac) | 0.005 | 0.011 | 0.020 | 0.012 |
| Surface loss (fuel gas, etc) | | 0.050 | | |
| Marketable gas (fraction of raw) | | 0.939 | | |

*Estimate of potential petroleum resources*

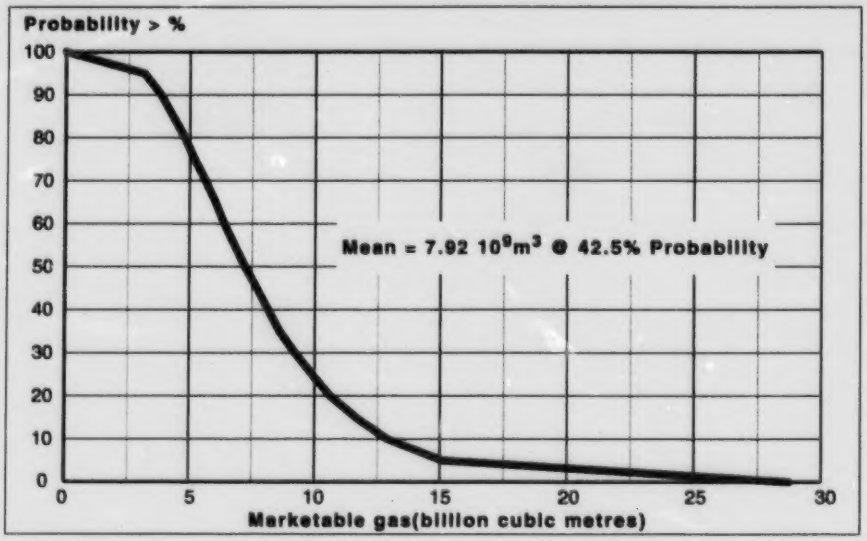
| | P95 | P50 | P05 | MEAN |
|---|---|---|---|---|
| Gas in place ($10^9m^3$) | 5.167 | 11.893 | 24.475 | 12.959 |
| Recoverable raw gas ($10^9m^3$) | 3.338 | 7.691 | 16.083 | 8.437 |
| Marketable gas ($10^9m^3$) | 3.134 | 7.221 | 15.099 | 7.922 |
| Oil in place ($10^6m^3$) | 1.276 | 3.909 | 11.032 | 4.695 |
| Recoverable oil ($10^6m^3$) | 0.042 | 0.167 | 0.572 | 0.219 |
| | | | | |
| Gas in place (Bcf) | 183.41 | 422.13 | 868.71 | 459.97 |
| Recoverable raw gas (Bcf) | 118.49 | 272.98 | 570.84 | 299.48 |
| Marketable gas (Bcf) | 111.24 | 256.30 | 535.93 | 281.17 |
| Oil in place (MMB) | 8.032 | 24.600 | 69.421 | 29.546 |
| Recoverable oil (MMB) | 0.267 | 1.053 | 3.603 | 1.378 |

*Total for play*

Oil depth: 900 m; Gas depth: 1,000 m; Gas reservoir temperature: 37°C; Pressure: 10,101 kPa

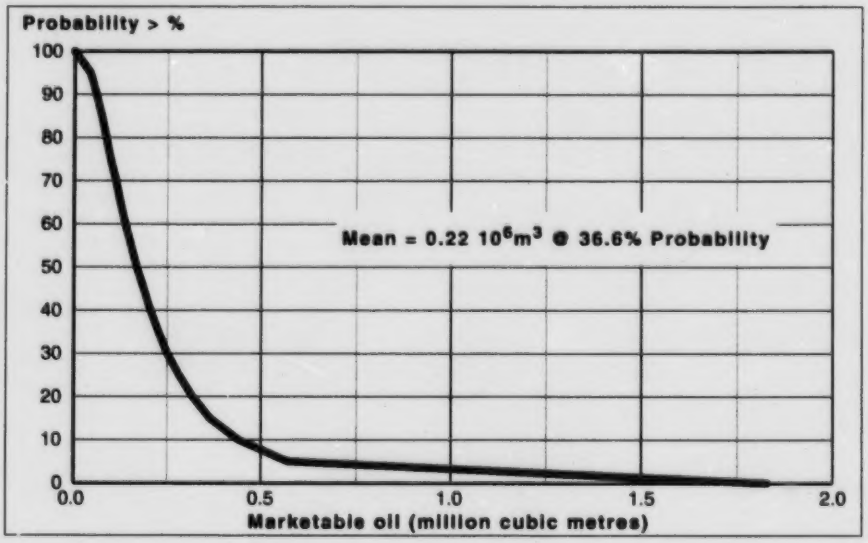
***Percentile values***

| | |
|---|---|
| 100% | 0.00 |
| 95% | 3.13 |
| 90% | 3.82 |
| 85% | 4.31 |
| 80% | 4.80 |
| 75% | 5.19 |
| 70% | 5.63 |
| 65% | 6.03 |
| 60% | 6.38 |
| 55% | 6.80 |
| 50% | 7.22 |
| 45% | 7.70 |
| 40% | 8.16 |
| 35% | 8.62 |
| 30% | 9.22 |
| 25% | 9.90 |
| 20% | 10.62 |
| 15% | 11.64 |
| 10% | 12.90 |
| 5% | 15.10 |
| 0% | 28.74 |




***Percentile values***

| | |
|---|---|
| 100% | 0.000 |
| 95% | 0.042 |
| 90% | 0.058 |
| 85% | 0.073 |
| 80% | 0.085 |
| 75% | 0.097 |
| 70% | 0.111 |
| 65% | 0.123 |
| 60% | 0.136 |
| 55% | 0.152 |
| 50% | 0.167 |
| 45% | 0.186 |
| 40% | 0.204 |
| 35% | 0.226 |
| 30% | 0.250 |
| 25% | 0.282 |
| 20% | 0.319 |
| 15% | 0.364 |
| 10% | 0.441 |
| 5% | 0.572 |
| 0% | 1.828 |




| | Oil ($10^6m^3$) | Solution gas ($10^9m^3$) | Non associated gas ($10^9m^3$) | Total gas ($10^9m^3$) | Liquids ($10^6m^3$) | Marketable gas ($10^9m^3$) |
|---|---|---|---|---|---|---|
| In place | 4.695 | | 12.96 | 12.96 | | |
| Recoverable | 0.219 | 0.011 | 8.44 | 8.44 | 0.13 | 7.92 |
| Sulphur (MMt) | 0.00 | | | | | |

# DISTURBED BELT
# PALEOZOIC CARBONATES

### *Reservoir description*

The Lower Devonian Arnica, Landry and Hume carbonates along the disturbed belt, fringing the Mackenzie and Richardson mountains, may contain fractured reservoirs not unlike the foothills of Alberta and northeastern British Columbia. Dolomites and limestones are the most dominant rock type, with minor interbedded shales. Thirty-nine structures have been identified on seismic within the disturbed belt.

The Arnica Formation dolomites are finely crystalline and, in part, sucrosic. They may develop intercrystalline and vuggy porosity. The Landry Formation is composed of fine-pelletoid limestone while the Hume Formation is shalier at the base and grades into cleaner carbonates in the upper section.

### *Potential resources*

The play area covers most of the disturbed belt eastward of the basinal area where a lithological change from mostly shales to mostly carbonates occurs. The play extends north and southeast of the Peel Plateau area. This play is considered entirely gas, given the limited data available on source rock maturation.

The assessment indicates that, within a 90% probability range, there is a marketable gas potential of 15.3 to 188.8 billion cubic metres (542 to 6,701 Bcf), with a mean of 24.7 billion cubic metres (878 Bcf) at a probability of 39.5%.

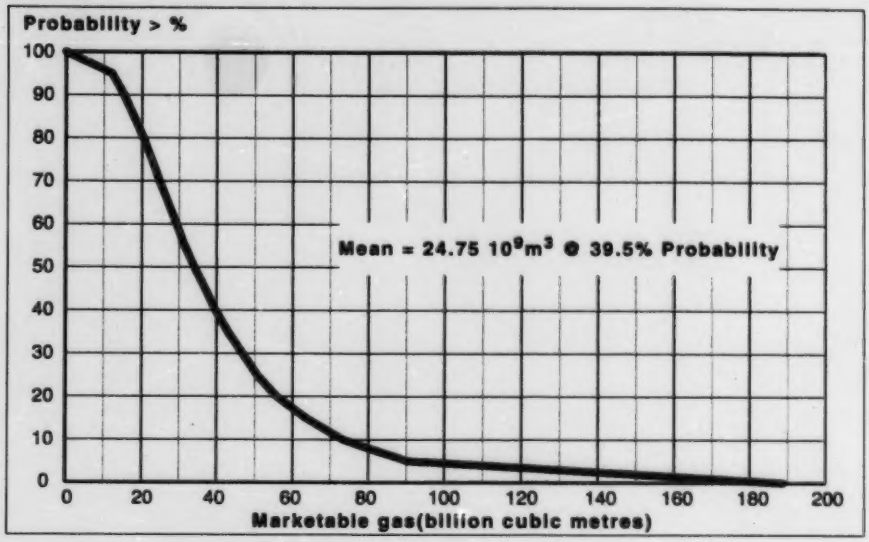
*Estimate of potential petroleum resources*

| | Minimum | Most likely | Maximum | Mean |
|---|---|---|---|---|
| Total play area (MM Hectares) | 0.400 | 0.413 | 0.435 | 0.416 |
| Tested play area (MM Hectares) | 0.002 | 0.002 | 0.002 | 0.002 |
| Untested play area (MM Hectares) | 0.398 | 0.411 | 0.433 | 0.414 |
| Fraction of total play area in trap | 0.100 | 0.150 | 0.300 | 0.183 |
| Fraction of untested area filled (areally) | 0.400 | 0.500 | 0.600 | 0.500 |
| Potential hydrocarbon area (MM hectares) | | | | 0.038 |
| Porosity | 0.030 | 0.060 | 0.120 | 0.070 |
| Hydrocarbon saturation | 0.700 | 0.770 | 0.800 | 0.757 |
| Oil recovery factor | 0.100 | 0.200 | 0.300 | 0.200 |
| Gas recovery factor | 0.600 | 0.750 | 0.900 | 0.750 |
| Average net pay (metres) | 30.0 | 50.0 | 150.0 | 76.7 |
| Probability of hydrocarbons | 0.050 | 0.200 | 0.250 | 0.167 |
| Fraction of pore volume oil bearing | 0.000 | 0.000 | 0.000 | 0.000 |
| Potential oil area (MM hectares) | | | | 0.000 |
| Potential gas area (MM hectares) | | | | 0.006 |
| GOR ($10^3m^3/m^3$) | 149.2 | 157.1 | 164.9 | 157.1 |
| Formation volume factor (FVF) | 1.416 | 1.491 | 1.565 | 1.491 |
| Gas compressibility factor 'Z' | 0.941 | 0.960 | 0.979 | 0.960 |
| Gas volume factor ($10^3m^3/m^3$) | | | | 0.227 |
| Oil in place ($m^3$/ha-m) | | | | 275.632 |
| Oil recovery ($m^3$/ha-m) | | | | 55.126 |
| Gas in place ($m^3$/ha-m) | | | | 120.473 |
| Raw gas recovery ($10^3m^3$/ha-m) | | | | 90.355 |
| Marketable gas recovery ($10^3m^3$/ha-m) | | | | 82.133 |
| Liquids yield ($m^3/10^6m^3$) | 12.000 | 15.900 | 19.900 | 15.933 |
| $H_2S$ content (frac) | 0.001 | 0.010 | 0.020 | 0.010 |
| $CO_2$ content (frac) | 0.005 | 0.011 | 0.020 | 0.012 |
| Surface loss (fuel gas, etc) | | 0.070 | | |
| Marketable gas (fraction of raw) | | 0.909 | | |

*Total for play*

| | P95 | P50 | P05 | MEAN |
|---|---|---|---|---|
| Gas in place ($10^9m^3$) | 22.652 | 54.357 | 280.488 | 35.819 |
| Recoverable raw gas ($10^9m^3$) | 16.811 | 40.670 | 207.706 | 27.224 |
| Marketable gas ($10^9m^3$) | 15.281 | 36.969 | 188.805 | 24.746 |
| Oil in place ($10^6m^3$) | 0.000 | 0.000 | 0.000 | 0.000 |
| Recoverable oil ($10^6m^3$) | 0.000 | 0.000 | 0.000 | 0.000 |
| | | | | |
| Gas in place (Bcf) | 804.00 | 1929.34 | 9955.58 | 1271.34 |
| Recoverable raw gas (Bcf) | 596.69 | 1443.53 | 7372.27 | 966.27 |
| Marketable gas (Bcf) | 542.39 | 1312.17 | 6701.39 | 878.34 |
| Oil in place (MMB) | 0.000 | 0.000 | 0.000 | 0.000 |
| Recoverable oil (MMB) | 0.000 | 0.000 | 0.000 | 0.000 |

Oil depth: 2,700 m; Gas depth: 2,800 m; Gas reservoir temperature: 93°C; Pressure: 28,101 kPa




| *Percentile values* | |
|---|---|
| 100% | 0.00 |
| 95% | 12.07 |
| 90% | 15.28 |
| 85% | 17.84 |
| 80% | 20.43 |
| 75% | 22.65 |
| 70% | 24.77 |
| 65% | 27.06 |
| 60% | 29.27 |
| 55% | 31.48 |
| 50% | 34.07 |
| 45% | 36.97 |
| 40% | 39.70 |
| 35% | 42.99 |
| 30% | 46.74 |
| 25% | 50.64 |
| 20% | 55.80 |
| 15% | 63.56 |
| 10% | 73.35 |
| 5% | 90.36 |
| 0% | 188.81 |

| | Oil ($10^6m^3$) | Solution gas ($10^6m^3$) | Non associated gas ($10^6m^3$) | Total gas ($10^9m^3$) | Liquids ($10^6m^3$) | Marketable gas ($10^9m^3$) |
|---|---|---|---|---|---|---|
| In place | 0.000 | | 35.82 | 35.82 | | |
| Recoverable | 0.000 | 0.000 | 27.22 | 27.22 | 0.70 | 24.75 |
| Sulphur (MMt) | 0.02 | | | | | |

## PLAINS AREA
## CRETACEOUS CLASTICS

### *Reservoir description*

As a stratigraphic play, the generally thin character, proximity to the surface and low thermal maturity make this a higher risk exploration play. The Martin House Formation has minor potential to have developed, reservoir quality sandstone. The coarse clastics of the Trevor formation are essentially at surface in the Yukon, are of limited distribution and subject to freshwater invasion. Although the Arctic Red Formation could have reservoir quality sandstone, it is not treated separately here.

Martin House sandstones have a tendency to be thin-bedded and argillaceous, although porous. A basal sandstone could be developed. However, like the Trevor Formation, proximity to the surface and deep dissection by river valleys may have allowed freshwater to invade.

### *Potential resources*

This assessment indicates that, within a 90% probability range, there is a marketable gas potential of 0.39 to 2.41 billion cubic metres (13.8 to 85.4 Bcf) with a mean of 1.15 billion cubic metres (40.8 Bcf) and a recoverable oil potential of 0.03 to 0.45 million cubic metres (1.74 to 2.82 MMB) with a mean of 0.17 million cubic metres (1.08 MMB).

*Estimate of potential petroleum resources*

| | Minimum | Most likely | Maximum | Mean |
|---|---|---|---|---|
| Total play area (MM Hectares) | 0.100 | 0.150 | 0.300 | 0.183 |
| Tested play area (MM Hectares) | 0.015 | 0.015 | 0.015 | 0.015 |
| Untested play area (MM Hectares) | 0.085 | 0.135 | 0.285 | 0.168 |
| Fraction of total play area in trap | 0.100 | 0.200 | 0.300 | 0.200 |
| Fraction of untested area filled (areally) | 0.400 | 0.500 | 0.600 | 0.500 |
| Potential hydrocarbon area (MM hectares) | | | | 0.017 |
| Porosity | 0.050 | 0.060 | 0.090 | 0.067 |
| Hydrocarbon saturation | 0.550 | 0.650 | 0.750 | 0.650 |
| Oil recovery factor | 0.050 | 0.100 | 0.200 | 0.117 |
| Gas recovery factor | 0.500 | 0.600 | 0.700 | 0.600 |
| Average net pay (metres) | 5.0 | 10.0 | 20.0 | 11.7 |
| Probability of hydrocarbons | 0.050 | 0.200 | 0.250 | 0.167 |
| Fraction of pore volume oil bearing | 0.001 | 0.100 | 0.300 | 0.134 |
| Potential oil area (MM hectares) | | | | 0.000 |
| Potential gas area (MM hectares) | | | | 0.002 |
| GOR ($10^3m^3/m^3$) | 82.9 | 87.3 | 91.6 | 87.3 |
| Formation volume factor (FVF) | 1.216 | 1.281 | 1.345 | 1.281 |
| Gas compressibility factor 'Z' | 0.764 | 0.780 | 0.796 | 0.780 |
| Gas volume factor ($10^3m^3/m^3$) | | | | 0.169 |
| Oil in place ($m^3$/ha-m) | | | | 338.403 |
| Oil recovery ($m^3$/ha-m) | | | | 39.480 |
| Gas in place ($m^3$/ha-m) | | | | 73.260 |
| Raw gas recovery ($10^3m^3$/ha-m) | | | | 43.956 |
| Marketable gas recovery ($10^3m^3$/ha-m) | | | | 39.947 |
| Liquids yield ($m^3/10^6m^3$) | 12.000 | 15.900 | 19.900 | 15.933 |
| $H_2S$ content (frac) | 0.000 | 0.000 | 0.000 | 0.000 |
| $CO_2$ content (frac) | 0.005 | 0.011 | 0.020 | 0.012 |
| Surface loss (fuel gas, etc) | | 0.080 | | |
| Marketable gas (fraction of raw) | | 0.909 | | |

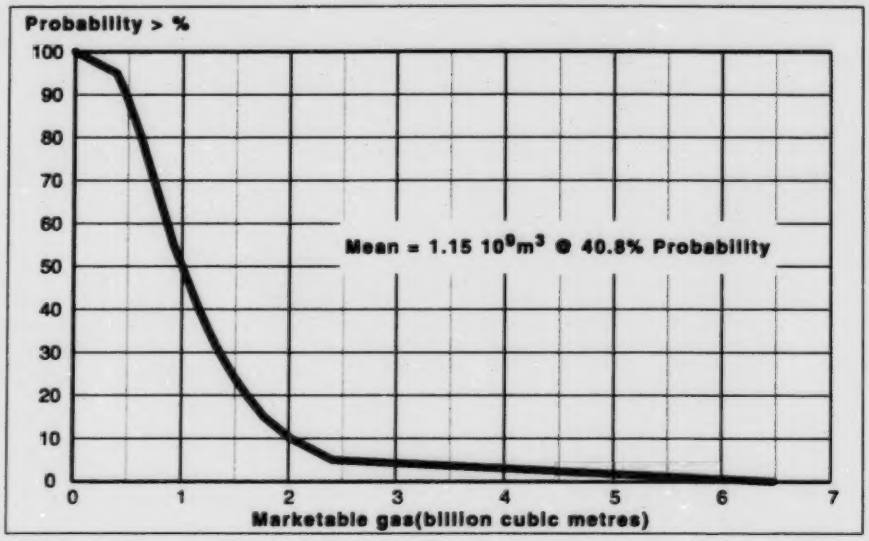
*Total for play*

| | P95 | P50 | P05 | MEAN |
|---|---|---|---|---|
| Gas in place ($10^9m^3$) | 0.715 | 1.810 | 4.298 | 2.083 |
| Recoverable raw gas ($10^9m^3$) | 0.428 | 1.100 | 2.646 | 1.265 |
| Marketable gas ($10^9m^3$) | 0.390 | 1.001 | 2.406 | 1.151 |
| Oil in place ($10^6m^3$) | 0.277 | 1.184 | 3.732 | 1.482 |
| Recoverable oil ($10^6m^3$) | 0.029 | 0.134 | 0.447 | 0.172 |
| | | | | |
| Gas in place (Bcf) | 25.40 | 64.24 | 152.57 | 73.92 |
| Recoverable raw gas (Bcf) | 15.20 | 39.04 | 93.92 | 44.90 |
| Marketable gas (Bcf) | 13.84 | 35.53 | 85.39 | 40.86 |
| Oil in place (MMB) | 1.744 | 7.452 | 23.482 | 9.324 |
| Recoverable oil (MMB) | 0.184 | 0.842 | 2.815 | 1.084 |

Oil depth: 1,500 m; Gas depth: 1,500 m; Gas reservoir temperature: 53°C; Pressure: 15,101 kPa

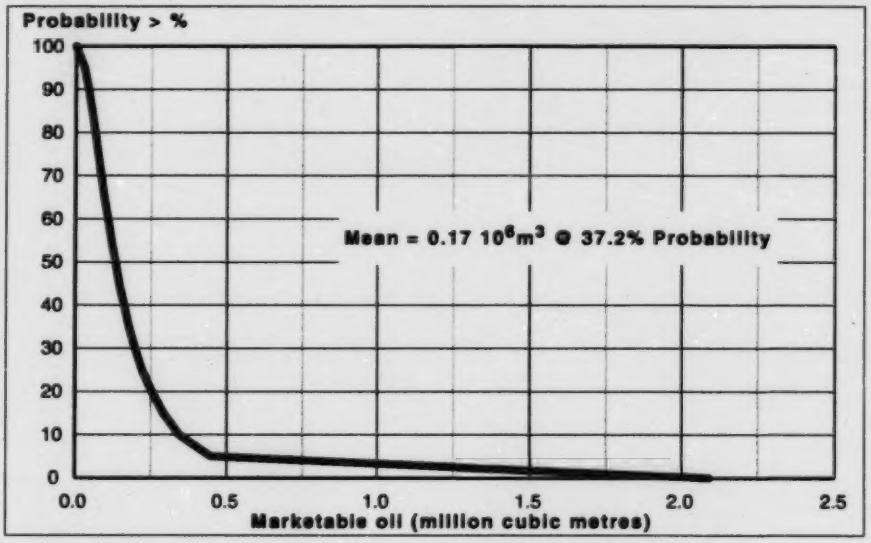
***Percentile values***

| | |
|---|---|
| 100% | 0.00 |
| 95% | 0.39 |
| 90% | 0.48 |
| 85% | 0.55 |
| 80% | 0.62 |
| 75% | 0.68 |
| 70% | 0.74 |
| 65% | 0.80 |
| 60% | 0.86 |
| 55% | 0.92 |
| 50% | 1.00 |
| 45% | 1.08 |
| 40% | 1.16 |
| 35% | 1.25 |
| 30% | 1.35 |
| 25% | 1.47 |
| 20% | 1.61 |
| 15% | 1.77 |
| 10% | 2.02 |
| 5% | 2.41 |
| 0% | 6.48 |




***Percentile values***

| | |
|---|---|
| 100% | 0.000 |
| 95% | 0.029 |
| 90% | 0.043 |
| 85% | 0.055 |
| 80% | 0.066 |
| 75% | 0.076 |
| 70% | 0.086 |
| 65% | 0.097 |
| 60% | 0.109 |
| 55% | 0.121 |
| 50% | 0.134 |
| 45% | 0.147 |
| 40% | 0.163 |
| 35% | 0.179 |
| 30% | 0.199 |
| 25% | 0.222 |
| 20% | 0.254 |
| 15% | 0.291 |
| 10% | 0.343 |
| 5% | 0.447 |
| 0% | 2.090 |




| | Oil ($10^6m^3$) | Solution gas ($10^9m^3$) | Non associated gas ($10^9m^3$) | Total gas ($10^9m^3$) | Liquids ($10^6m^3$) | Marketable gas ($10^9m^3$) |
|---|---|---|---|---|---|---|
| In place | 1.482 | | 2.08 | 2.08 | | |
| Recoverable | 0.172 | 0.015 | 1.27 | 1.27 | 0.02 | 1.15 |
| Sulphur (MMt) | 0.00 | | | | | |

# PLAINS AREA
# CARBONIFEROUS CLASTICS

### *Reservoir description*

The Tuttle Formation pinch-out play occurs where the Tuttle conglomerate channels, and other sand bodies, pinch-out within the dominated shale stratigraphic section.

The section consists of repeated cycles of discontinuous conglomerates and sands, interbedded with shale and siltstone. The Tuttle Formation subcrops to the northeast, immediately east of the Yukon/Northwest Territories border. It outcrops to the west along the uplift of the Richardson Mountains, and undergoes a facies change to the southwest, pinching out into the Imperial and Ford Lake shale. The Tuttle Formation exhibits a maximum thickness of 1,198 metres, and a maximum net sand thickness of 236 metres in the subsurface to the east of the Richardson Mountains.

The reservoir rock consists of a mixture of conglomerate and sandstones, interbedded with siltstones and shales deposited in a fluvio-deltaic environment. The Tuttle reservoir sandstones and conglomerates are mostly poorly sorted with kaolinitic matrix, and exhibit generally poor porosities and permeabilities. Reservoir quality appears to improve to the south.

Bitumen plugging is commonly found in the Tuttle. Gas shows are found in Shell Peel River YT B-06 which tested gas to surface, too small to measure. No significant Tuttle Formation hydrocarbon shows have been found on the east side of the Richardson Mountains, however numerous recoveries of gas and oil occur in the Eagle Plain area to the west of the Richardson Mountains.

The greatest risk with the Tuttle play is the likelihood of freshwater flushing of the reservoirs due to proximity to the outcrop. Further, the overlying Cretaceous sand of the Martin House Formation likely acts as a thief zone above the Tuttle subcrop trend. Seismic interpretation does, however, indicate that the apparent reservoir zones are discontinuous and could result in internal pinch-outs in the shale section.

### *Potential resources*

This assessment indicates that, within a 90% probability range, there is a marketable gas potential of 1.01 billion cubic metres (35.7 Bcf) to 7.90 billion cubic metres (280.3 Bcf) with a mean of 3.60 billion cubic metres (127.8 Bcf). There is some possibility for oil, however, assessed volumes are small, with a mean of only 4.0 thousand cubic metres (23 MB).

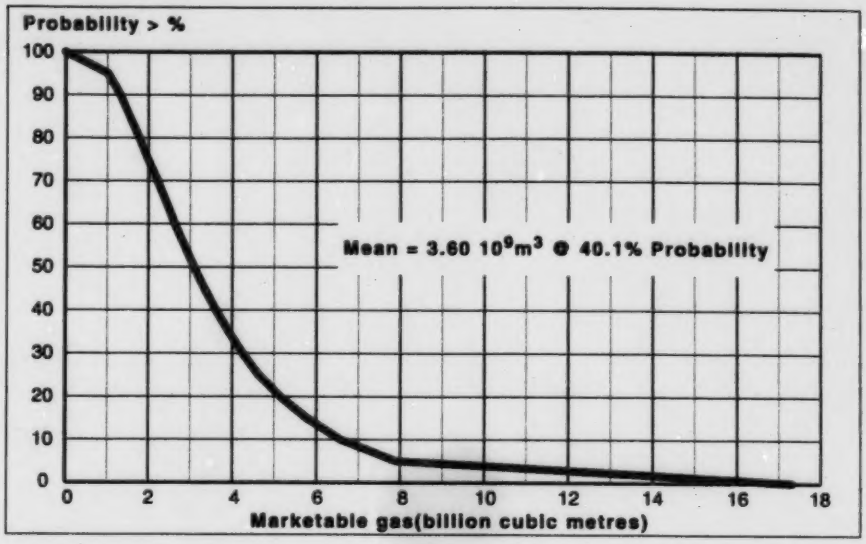
*Estimate of potential petroleum resources*

| | Minimum | Most likely | Maximum | Mean |
|---|---|---|---|---|
| Total play area (MM Hectares) | 0.200 | 0.300 | 0.500 | 0.333 |
| Tested play area (MM Hectares) | 0.020 | 0.030 | 0.033 | 0.028 |
| Untested play area (MM Hectares) | 0.180 | 0.270 | 0.467 | 0.306 |
| Fraction of total play area in trap | 0.100 | 0.200 | 0.300 | 0.200 |
| Fraction of untested area filled (areally) | 0.200 | 0.300 | 0.500 | 0.333 |
| Potential hydrocarbon area (MM hectares) | | | | 0.020 |
| Porosity | 0.060 | 0.150 | 0.250 | 0.153 |
| Hydrocarbon saturation | 0.700 | 0.750 | 0.800 | 0.750 |
| Oil recovery factor | 0.050 | 0.100 | 0.200 | 0.117 |
| Gas recovery factor | 0.700 | 0.800 | 0.900 | 0.800 |
| Average net pay (metres) | 15.0 | 30.0 | 45.0 | 30.0 |
| Probability of hydrocarbons | 0.010 | 0.050 | 0.100 | 0.053 |
| Fraction of pore volume oil bearing | 0.000 | 0.001 | 0.002 | 0.001 |
| Potential oil area (MM hectares) | | | | 0.000 |
| Potential gas area (MM hectares) | | | | 0.001 |
| GOR ($10^3m^3/m^3$) | 55.3 | 58.2 | 61.1 | 58.2 |
| Formation volume factor (FVF) | 1.128 | 1.187 | 1.246 | 1.187 |
| Gas compressibility factor 'Z' | 0.686 | 0.700 | 0.714 | 0.700 |
| Gas volume factor ($10^3m^3/m^3$) | | | | 0.132 |
| Oil in place ($m^3$/ha-m) | | | | 968.815 |
| Oil recovery ($m^3$/ha-m) | | | | 113.028 |
| Gas in place ($m^3$/ha-m) | | | | 152.158 |
| Raw gas recovery ($10^3m^3$/ha-m) | | | | 121.726 |
| Marketable gas recovery ($10^3m^3$/ha-m) | | | | 110.625 |
| Liquids yield ($m^3/10^6m^3$) | 12.000 | 15.900 | 19.900 | 15.933 |
| $H_2S$ content (frac) | 0.000 | 0.000 | 0.000 | 0.000 |
| $CO_2$ content (frac) | 0.005 | 0.011 | 0.020 | 0.012 |
| Surface loss (fuel gas, etc) | | 0.080 | | |
| Marketable gas (fraction of raw) | | 0.909 | | |

*Total for play*

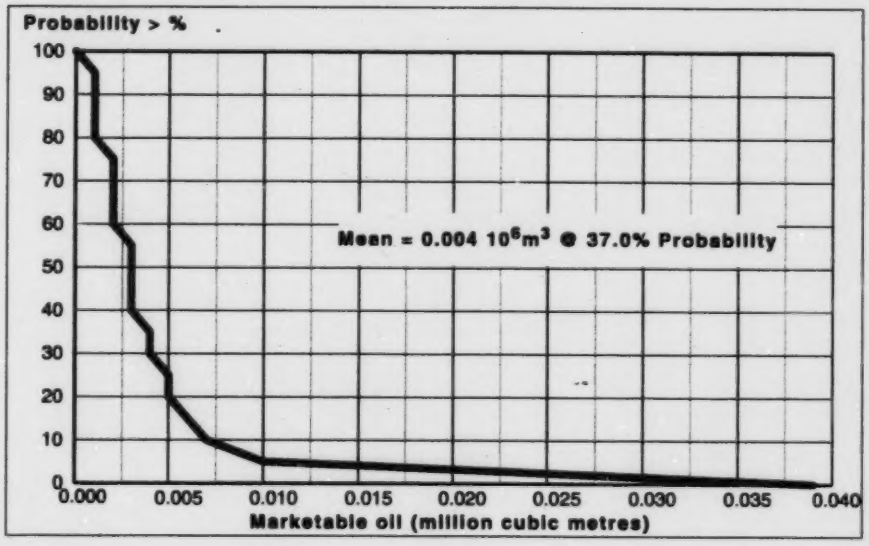
| | P95 | P50 | P05 | MEAN |
|---|---|---|---|---|
| Gas in place ($10^9m^3$) | 1.389 | 4.242 | 10.805 | 4.952 |
| Recoverable raw gas ($10^9m^3$) | 1.107 | 3.395 | 8.689 | 3.961 |
| Marketable gas ($10^9m^3$) | 1.006 | 3.085 | 7.897 | 3.600 |
| Oil in place ($10^6m^3$) | 0.006 | 0.025 | 0.078 | 0.031 |
| Recoverable oil ($10^6m^3$) | 0.001 | 0.003 | 0.010 | 0.004 |
| | | | | |
| Gas in place (Bcf) | 49.29 | 150.55 | 383.51 | 175.76 |
| Recoverable raw gas (Bcf) | 39.28 | 120.50 | 308.40 | 140.60 |
| Marketable gas (Bcf) | 35.70 | 109.51 | 280.28 | 127.78 |
| Oil in place (MMB) | 0.036 | 0.157 | 0.492 | 0.198 |
| Recoverable oil (MMB) | 0.004 | 0.018 | 0.060 | 0.023 |

Oil depth: 1,000 m; Gas depth: 1,000 m; Gas reservoir temperature: 37°C; Pressure: 10,101 kPa




*Percentile values*

| | |
|---|---|
| 100% | 0.00 |
| 95% | 1.01 |
| 90% | 1.31 |
| 85% | 1.54 |
| 80% | 1.78 |
| 75% | 1.99 |
| 70% | 2.22 |
| 65% | 2.43 |
| 60% | 2.63 |
| 55% | 2.86 |
| 50% | 3.09 |
| 45% | 3.34 |
| 40% | 3.61 |
| 35% | 3.92 |
| 30% | 4.25 |
| 25% | 4.63 |
| 20% | 5.14 |
| 15% | 5.77 |
| 10% | 6.57 |
| 5% | 7.90 |
| 0% | 17.31 |




*Percentile values*

| | |
|---|---|
| 100% | 0.000 |
| 95% | 0.001 |
| 90% | 0.001 |
| 85% | 0.001 |
| 80% | 0.001 |
| 75% | 0.002 |
| 70% | 0.002 |
| 65% | 0.002 |
| 60% | 0.002 |
| 55% | 0.003 |
| 50% | 0.003 |
| 45% | 0.003 |
| 40% | 0.003 |
| 35% | 0.004 |
| 30% | 0.004 |
| 25% | 0.005 |
| 20% | 0.005 |
| 15% | 0.006 |
| 10% | 0.007 |
| 5% | 0.010 |
| 0% | 0.039 |

| | Oil ($10^6m^3$) | Solution gas ($10^9m^3$) | Non associated gas ($10^9m^3$) | Total gas ($10^9m^3$) | Liquids ($10^6m^3$) | Marketable gas ($10^9m^3$) |
|---|---|---|---|---|---|---|
| In place | 0.031 | | 4.95 | 4.95 | | |
| Recoverable | 0.004 | 0.000 | 3.96 | 3.96 | 0.06 | 3.60 |
| Sulphur (MMt) | 0.00 | | | | | |

# PLAINS AREA
# DEVONIAN ISOLATED REEFS

### *Reservoir description*

During Lower to Middle Devonian time, carbonate sedimentation predominated along the eastern edge of the study area. Westward, towards the Richardson Mountains, basinal sediments were deposited, with potential for isolated carbonate buildups rooted on the Arnica, Landry and Hume carbonate platforms. These reefs tend to develop reservoir porosity in high energy facies and associated bioclastic debris. The size of these buildups could vary, however, a kilometre in diameter is likely.

### *Potential resources*

This assessment indicates that, within a 90% probability range, there is a marketable gas potential of 2.78 billion cubic metres (98.5 Bcf) to 23.21 billion cubic metres (823.7 Bcf) with a mean of 10.56 billion cubic metres (374.6 Bcf) and a recoverable oil potential of 0.58 million cubic metres (3.63 MMB) to 6.70 million cubic metres (42.18 MMB) with a mean of 2.72 million cubic metres (17.13 MMB).

*Estimate of potential petroleum resources*

| | Minimum | Most likely | Maximum | Mean |
|---|---|---|---|---|
| Total play area (MM Hectares) | 0.416 | 0.475 | 0.535 | 0.475 |
| Tested play area (MM Hectares) | 0.024 | 0.024 | 0.024 | 0.024 |
| Untested play area (MM Hectares) | 0.392 | 0.451 | 0.511 | 0.451 |
| Fraction of total play area in trap | 0.036 | 0.060 | 0.100 | 0.065 |
| Fraction of untested area filled (areally) | 0.050 | 0.500 | 0.950 | 0.500 |
| Potential hydrocarbon area (MM hectares) | | | | 0.015 |
| Porosity | 0.040 | 0.080 | 0.120 | 0.080 |
| Hydrocarbon saturation | 0.700 | 0.800 | 0.900 | 0.800 |
| Oil recovery factor | 0.200 | 0.300 | 0.400 | 0.300 |
| Gas recovery factor | 0.600 | 0.800 | 0.900 | 0.767 |
| Average net pay (metres) | 30.0 | 60.0 | 90.0 | 60.0 |
| Probability of hydrocarbons | 0.050 | 0.100 | 0.200 | 0.117 |
| Fraction of pore volume oil bearing | 0.050 | 0.200 | 0.350 | 0.200 |
| Potential oil area (MM hectares) | | | | 0.000 |
| Potential gas area (MM hectares) | | | | 0.001 |
| GOR ($10^3m^3/m^3$) | 138.2 | 145.4 | 152.7 | 145.4 |
| Formation volume factor (FVF) | 1.394 | 1.468 | 1.541 | 1.468 |
| Gas compressibility factor 'Z' | 0.784 | 0.800 | 0.816 | 0.800 |
| Gas volume factor ($10^3m^3/m^3$) | | | | 0.265 |
| Oil in place ($m^3$/ha-m) | | | | 436.104 |
| Oil recovery ($m^3$/ha-m) | | | | 130.831 |
| Gas in place ($m^3$/ha-m) | | | | 169.906 |
| Raw gas recovery ($10^3m^3$/ha-m) | | | | 130.261 |
| Marketable gas recovery ($10^3m^3$/ha-m) | | | | 122.289 |
| Liquids yield ($m^3/10^6m^3$) | 12.000 | 15.900 | 19.900 | 15.933 |
| $H_2S$ content (frac) | 0.000 | 0.000 | 0.000 | 0.000 |
| $CO_2$ content (frac) | 0.005 | 0.011 | 0.020 | 0.012 |
| Surface loss (fuel gas, etc) | | 0.050 | | |
| Marketable gas (fraction of raw) | | 0.939 | | |

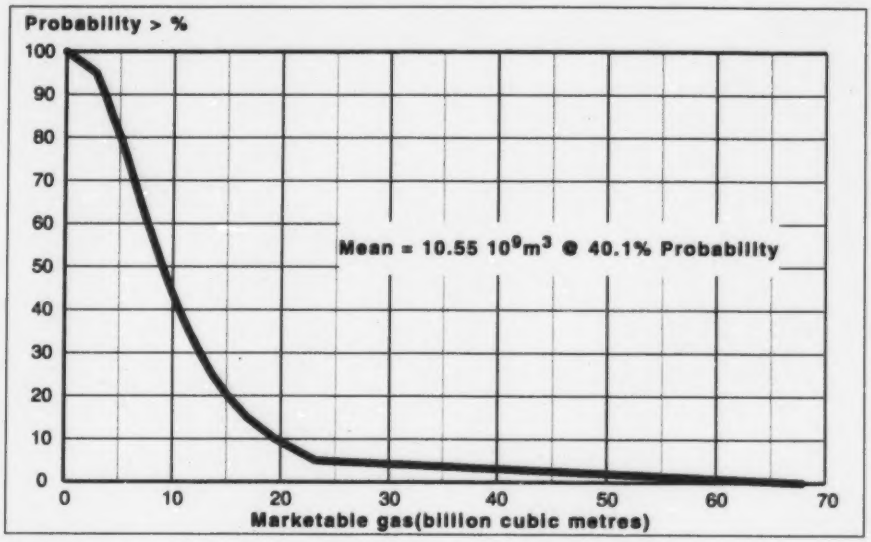
*Total for play*

| | P95 | P50 | P05 | MEAN |
|---|---|---|---|---|
| Gas in place ($10^9m^3$) | 3.788 | 12.112 | 31.256 | 14.107 |
| Recoverable raw gas ($10^9m^3$) | 2.950 | 9.586 | 24.640 | 11.217 |
| Marketable gas ($10^9m^3$) | 2.776 | 9.017 | 23.206 | 10.555 |
| Oil in place ($10^6m^3$) | 1.960 | 7.329 | 22.024 | 9.066 |
| Recoverable oil ($10^6m^3$) | 0.577 | 2.154 | 6.703 | 2.722 |
| | | | | |
| Gas in place (Bcf) | 134.46 | 429.90 | 1109.39 | 500.71 |
| Recoverable raw gas (Bcf) | 104.70 | 340.26 | 874.56 | 398.13 |
| Marketable gas (Bcf) | 98.52 | 320.05 | 823.68 | 374.62 |
| Oil in place (MMB) | 12.333 | 46.118 | 138.593 | 57.052 |
| Recoverable oil (MMB) | 3.634 | 13.556 | 42.183 | 17.130 |

Oil depth: 2,500 m; Gas depth: 2,700 m; Gas reservoir temperature: 90°C; Pressure: 27,101 kPa

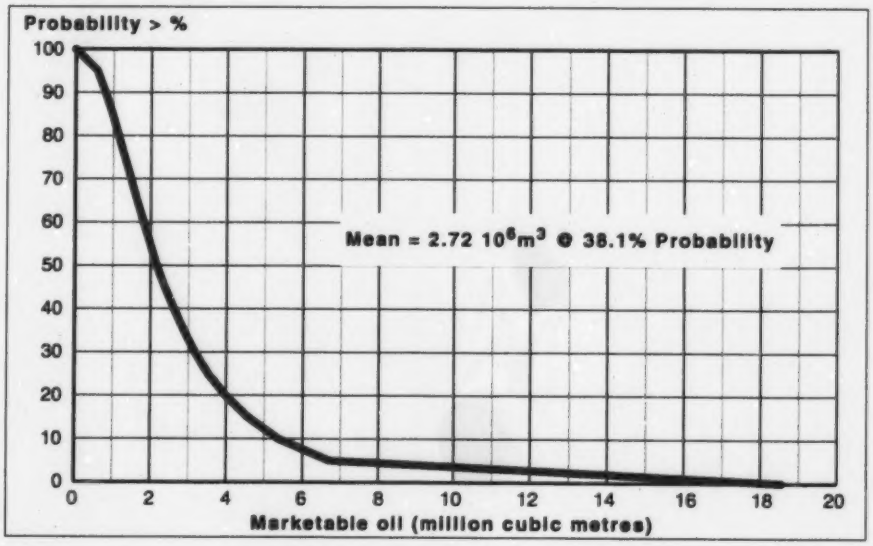
*Percentile values*

| | |
|---|---|
| 100% | 0.00 |
| 95% | 2.78 |
| 90% | 3.61 |
| 85% | 4.31 |
| 80% | 5.08 |
| 75% | 5.74 |
| 70% | 6.35 |
| 65% | 6.97 |
| 60% | 7.65 |
| 55% | 8.34 |
| 50% | 9.02 |
| 45% | 9.76 |
| 40% | 10.59 |
| 35% | 11.50 |
| 30% | 12.51 |
| 25% | 13.62 |
| 20% | 15.09 |
| 15% | 16.89 |
| 10% | 19.47 |
| 5% | 23.21 |
| 0% | 67.89 |




*Percentile values*

| | |
|---|---|
| 100% | 0.000 |
| 95% | 0.577 |
| 90% | 0.793 |
| 85% | 0.980 |
| 80% | 1.143 |
| 75% | 1.309 |
| 70% | 1.476 |
| 65% | 1.635 |
| 60% | 1.807 |
| 55% | 1.984 |
| 50% | 2.154 |
| 45% | 2.375 |
| 40% | 2.615 |
| 35% | 2.881 |
| 30% | 3.171 |
| 25% | 3.518 |
| 20% | 3.984 |
| 15% | 4.573 |
| 10% | 5.366 |
| 5% | 6.703 |
| 0% | 18.558 |




| | Oil ($10^6m^3$) | Solution gas ($10^9m^3$) | Non associated gas ($10^9m^3$) | Total gas ($10^9m^3$) | Liquids ($10^6m^3$) | Marketable gas ($10^9m^3$) |
|---|---|---|---|---|---|---|
| In place | 9.066 | | 14.11 | 14.11 | | |
| Recoverable | 2.722 | 0.393 | 11.22 | 11.22 | 0.17 | 10.55 |
| Sulphur (MMt) | 0.00 | | | | | |

# PLAINS AREA
# DEVONIAN FRACTURED ARNICA DOLOMITE

## *Reservoir description*

The Arnica Formation represents an exploration target elsewhere in the southern Mackenzie corridor. The reservoir is often composed of fractured and secondary dolomite. The dolomites of the Arnica are often light to dark brown in colour, finely crystalline and, in part, sucrosic. The porosity varies, and a maximum of 9% is used for this evaluation. The thickness of the Arnica ranges to a maximum of 75 metres in the northeast, just outside of this study area.

## *Potential resources*

This assessment indicates that, within a 90% probability range, there is a marketable gas potential of 0.27 billion cubic metres (9.64 Bcf) to 2.68 billion cubic metres (95.03 Bcf) with a mean of 1.20 billion cubic metres (42.46 Bcf) and a recoverable oil potential of 0.05 million cubic metres (0.28 MMB) to 0.67 million cubic metres (4.19 MMB) with a mean of 0.26 million cubic metres (1.65 MMB).

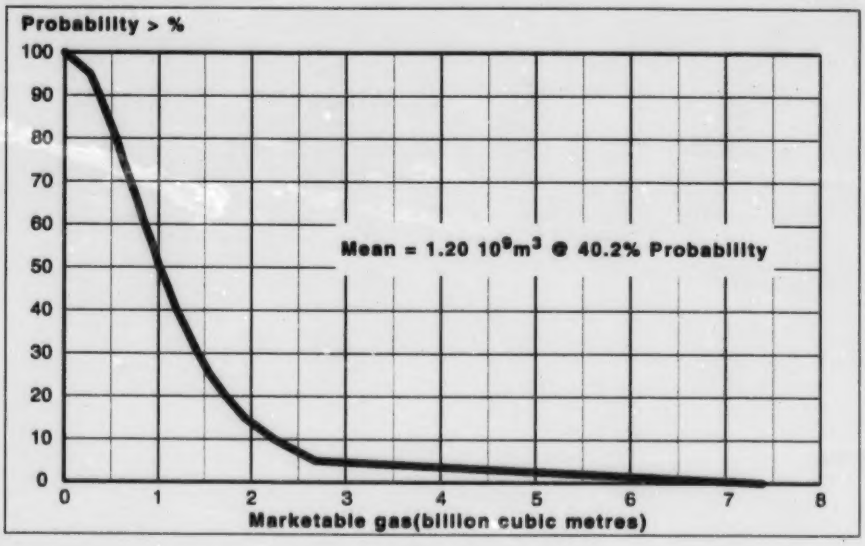
*Estimate of potential petroleum resources*

| | Minimum | Most likely | Maximum | Mean |
|---|---|---|---|---|
| Total play area (MM Hectares) | 0.416 | 0.475 | 0.535 | 0.475 |
| Tested play area (MM Hectares) | 0.024 | 0.024 | 0.024 | 0.024 |
| Untested play area (MM Hectares) | 0.392 | 0.451 | 0.511 | 0.451 |
| Fraction of total play area in trap | 0.015 | 0.030 | 0.050 | 0.032 |
| Fraction of untested area filled (areally) | 0.020 | 0.250 | 0.500 | 0.257 |
| Potential hydrocarbon area (MM hectares) | | | | 0.004 |
| Porosity | 0.030 | 0.060 | 0.090 | 0.060 |
| Hydrocarbon saturation | 0.700 | 0.770 | 0.800 | 0.757 |
| Oil recovery factor | 0.100 | 0.200 | 0.400 | 0.233 |
| Gas recovery factor | 0.600 | 0.650 | 0.900 | 0.717 |
| Average net pay (metres) | 30.0 | 50.0 | 100.0 | 60.0 |
| Probability of hydrocarbons | 0.025 | 0.100 | 0.125 | 0.083 |
| Fraction of pore volume oil bearing | 0.050 | 0.200 | 0.350 | 0.200 |
| Potential oil area (MM hectares) | | | | 0.000 |
| Potential gas area (MM hectares) | | | | 0.000 |
| GOR ($10^3m^3/m^3$) | 143.7 | 151.2 | 158.8 | 151.2 |
| Formation volume factor (FVF) | 1.412 | 1.486 | 1.561 | 1.486 |
| Gas compressibility factor 'Z' | 0.833 | 0.850 | 0.867 | 0.850 |
| Gas volume factor ($10^3m^3/m^3$) | | | | 0.257 |
| Oil in place ($m^3$/ha-m) | | | | 305.468 |
| Oil recovery ($m^3$/ha-m) | | | | 71.276 |
| Gas in place ($m^3$/ha-m) | | | | 116.626 |
| Raw gas recovery ($10^3m^3$/ha-m) | | | | 83.582 |
| Marketable gas recovery ($10^3m^3$/ha-m) | | | | 78.467 |
| Liquids yield ($m^3/10^6m^3$) | 12.000 | 15.900 | 19.900 | 15.933 |
| $H_2S$ content (frac) | 0.000 | 0.000 | 0.000 | 0.000 |
| $CO_2$ content (frac) | 0.005 | 0.011 | 0.020 | 0.012 |
| Surface loss (fuel gas, etc) | | 0.050 | | |
| Marketable gas (fraction of raw) | | 0.939 | | |

*Total for play*

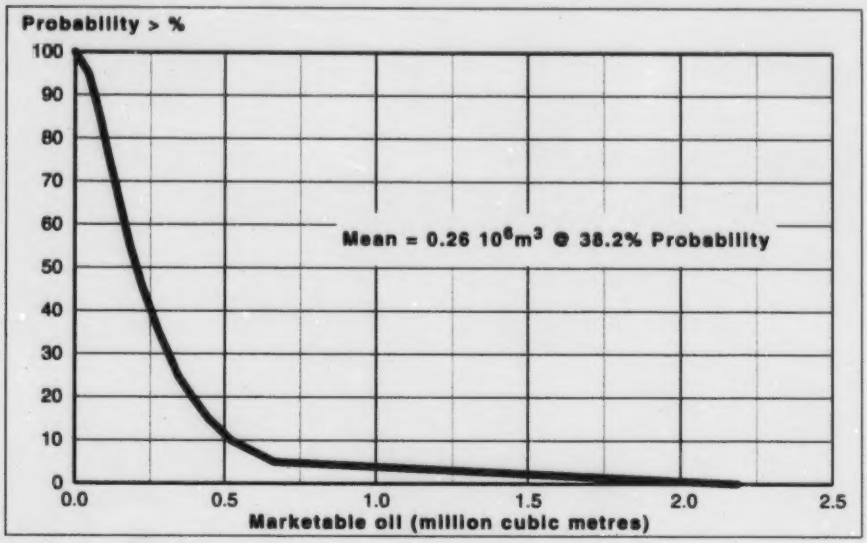
| | P95 | P50 | P05 | MEAN |
|---|---|---|---|---|
| Gas in place ($10^9m^3$) | 0.397 | 1.469 | 3.853 | 1.717 |
| Recoverable raw gas ($10^9m^3$) | 0.289 | 1.079 | 2.846 | 1.272 |
| Marketable gas ($10^9m^3$) | 0.272 | 1.015 | 2.677 | 1.196 |
| Oil in place ($10^6m^3$) | 0.212 | 0.923 | 2.762 | 1.126 |
| Recoverable oil ($10^6m^3$) | 0.045 | 0.204 | 0.666 | 0.261 |
| | | | | |
| Gas in place (Bcf) | 14.08 | 52.15 | 136.74 | 60.96 |
| Recoverable raw gas (Bcf) | 10.25 | 38.32 | 101.02 | 45.13 |
| Marketable gas (Bcf) | 9.64 | 36.02 | 95.03 | 42.46 |
| Oil in place (MMB) | 1.337 | 5.807 | 17.379 | 7.083 |
| Recoverable oil (MMB) | 0.282 | 1.285 | 4.188 | 1.645 |

Oil depth: 2,600 m; Gas depth: 2,800 m; Gas reservoir temperature: 93°C; Pressure: 28,101 kPa




***Percentile values***

| | |
|---|---|
| 100% | 0.00 |
| 95% | 0.27 |
| 90% | 0.37 |
| 85% | 0.46 |
| 80% | 0.55 |
| 75% | 0.62 |
| 70% | 0.70 |
| 65% | 0.78 |
| 60% | 0.85 |
| 55% | 0.94 |
| 50% | 1.01 |
| 45% | 1.11 |
| 40% | 1.20 |
| 35% | 1.32 |
| 30% | 1.43 |
| 25% | 1.56 |
| 20% | 1.73 |
| 15% | 1.93 |
| 10% | 2.25 |
| 5% | 2.68 |
| 0% | 7.39 |




***Percentile values***

| | |
|---|---|
| 100% | 0.000 |
| 95% | 0.045 |
| 90% | 0.065 |
| 85% | 0.083 |
| 80% | 0.099 |
| 75% | 0.115 |
| 70% | 0.133 |
| 65% | 0.149 |
| 60% | 0.166 |
| 55% | 0.183 |
| 50% | 0.204 |
| 45% | 0.226 |
| 40% | 0.252 |
| 35% | 0.279 |
| 30% | 0.312 |
| 25% | 0.344 |
| 20% | 0.393 |
| 15% | 0.447 |
| 10% | 0.522 |
| 5% | 0.666 |
| 0% | 2.188 |

| | Oil ($10^6m^3$) | Solution gas ($10^6m^3$) | Non associated gas ($10^6m^3$) | Total gas ($10^6m^3$) | Liquids ($10^6m^3$) | Marketable gas ($10^6m^3$) |
|---|---|---|---|---|---|---|
| In place | 1.126 | | 1.72 | 1.72 | | |
| Recoverable | 0.261 | 0.040 | 1.27 | 1.27 | 0.02 | 1.20 |
| Sulphur (MMlt) | 0.00 | | | | | |

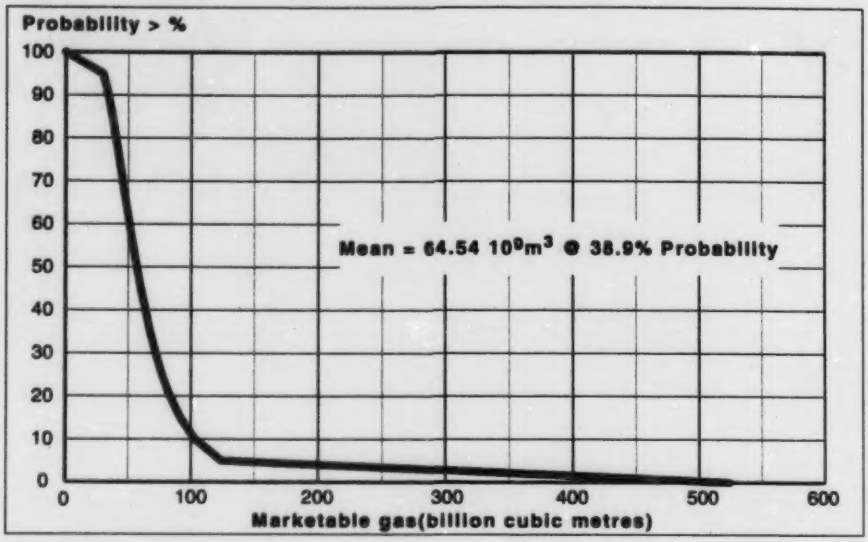
# DISCUSSION OF RESULTS

The probability charts for the Peel Basin, showing the total undiscovered marketable gas and the total undiscovered recoverable oil, are on the following pages. The range for marketable gas is from 29.7 billion cubic metres (1.1 Tcf) at 95% probability, to 64.6 billion cubic metres (4.4 Tcf) at 5% probability, with a mean of 64.6 billion cubic metres (2.29 Tcf) at a probability of 39%. The range for recoverable oil is from 1.06 million cubic metres (6.7 MMBbls) at 95% probability, to 8.05 million cubic metres (50.7 MMBbls) at 5% probability, with a mean of 3.4 million cubic metres (21.3 MMBbls) at 35% probability.

On an overall play basis, the Paleozoic carbonates of the Disturbed Belt contain the vast majority of the potential undiscovered marketable gas at 78.5% of the mean estimate, followed by the Paleozoic isolated reefs of the Plains area at 16.3%. However in the case of oil, the Paleozoic isolated reefs of the Plains are estimated to have 80.6% of the total mean potential. In total, carbonate reservoirs are expected to contain over 80% of the marketable gas and over 88% of the recoverable oil.

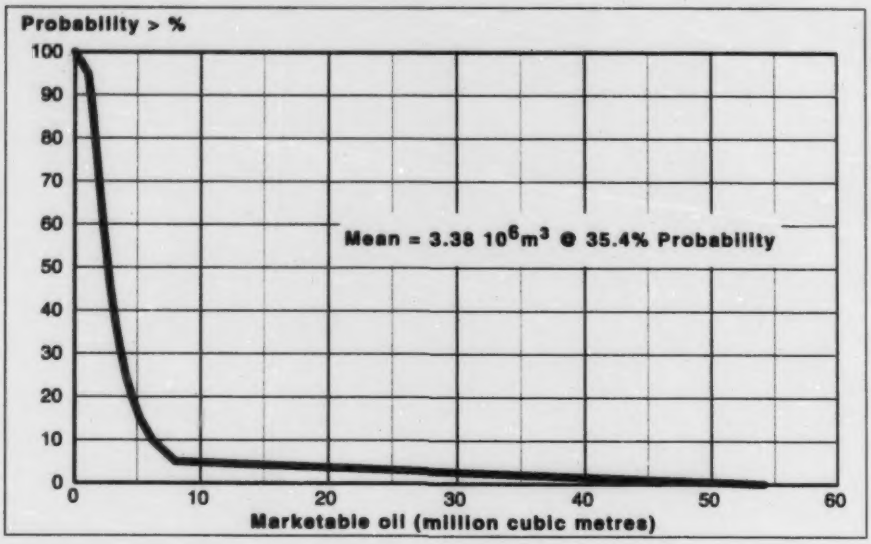
*Peel Basin potential resources*

| Play number | Play Name | Recoverable Oil (million cubic metres) Mean | Recoverable Oil (million cubic metres) Std. Dev. | Marketable Gas (billion cubic metres) Mean | Marketable Gas (billion cubic metres) Std. Dev. |
|---|---|---|---|---|---|
| 1 | Disturbed Belt - Paleozoic and Cretaceous Clastics | 0.219 | 0.181 | 7.92 | 3.78 |
| 2 | Disturbed Belt - Paleozoic Carbonates | | | 40.12 | 24.75 |
| 3 | Plains Area - Cretaceous Clastics | 0.172 | 0.145 | 1.15 | 0.65 |
| 4 | Plains Area - Carboniferous Clastics | 0.004 | 0.003 | 3.60 | 2.22 |
| 5 | Plains Area - Devonian Isolated Reefs | 2.722 | 2.046 | 10.55 | 6.80 |
| 6 | Plains Area - Devonian Fractured Arnica Dolomite | 0.261 | 0.209 | 1.20 | 0.81 |
| | **TOTALS** | **3.378** | **2.587** | **64.55** | **32.63** |
| | | **P95** | **P50** | **P05** | **MEAN** |
| | Total recoverable oil ($10^6 m^3$) | 1.06 | 2.67 | 8.05 | 3.378 |
| | Total marketable gas ($10^6 m^3$) | 29.75 | 56.94 | 123.98 | 64.55 |
| | Total recoverable oil (MMB) | 6.67 | 16.80 | 50.69 | 21.26 |
| | Total marketable gas (BCF) | 1,056.1 | 2,020.9 | 4,400.7 | 2,291.0 |




*Percentile values*

| | |
|---|---|
| 100% | 0.0 |
| 95% | 29.8 |
| 90% | 34.1 |
| 85% | 37.3 |
| 80% | 40.2 |
| 75% | 42.9 |
| 70% | 45.5 |
| 65% | 48.3 |
| 60% | 51.0 |
| 55% | 54.0 |
| 50% | 56.9 |
| 45% | 60.2 |
| 40% | 63.8 |
| 35% | 67.5 |
| 30% | 71.9 |
| 25% | 77.1 |
| 20% | 83.4 |
| 15% | 91.6 |
| 10% | 103.2 |
| 5% | 124.0 |
| 0% | 524.0 |




*Percentile values*

| | |
|---|---|
| 100% | 0.00 |
| 95% | 1.06 |
| 90% | 1.28 |
| 85% | 1.47 |
| 80% | 1.63 |
| 75% | 1.79 |
| 70% | 1.95 |
| 65% | 2.12 |
| 60% | 2.29 |
| 55% | 2.48 |
| 50% | 2.67 |
| 45% | 2.87 |
| 40% | 3.12 |
| 35% | 3.40 |
| 30% | 3.72 |
| 25% | 4.10 |
| 20% | 4.59 |
| 15% | 5.22 |
| 10% | 6.19 |
| 5% | 8.05 |
| 0% | 54.19 |

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# APPENDIX: WELLS IN THE STUDY AREA

## GULF MOBIL – CARIBOU YT N-25

Drilling Authority Number ..... 0759
Unique Well Identifier ..... 300N256620134450
Classification ..... New Field Wildcat
Latitude ..... 66°14'46.0" Longitude ..... 134°50'04.0"
Spud Date ..... 1-MAY-74 Rig Released ..... 10-AUG-74
Status ..... Dry and Abandoned
K.B. (ft) ..... 1,625, 495.3 m
T.D. (ft) ..... 11,812, 3600.3 m
Logs available ..... DILL, BHC-S, CAL, CN-FD, DIP, SYN
Sample Intervals (ftKB) ..... 0 - 11812, 0 - 3600.3 (mKB)

***Cored Intervals***

| Interval No. | (Ftkb) | (Mkb) |
|---|---|---|
| 1 | 5,881 - 5,941 | 1,792.5 - 1,810.8 |

***DST/RFT/EFT Tests***

| Test No. | (Ftkb) | Results | (Mkb) | Results |
|---|---|---|---|---|
| 1 | 9,890 - 10,350 | m.r. | 3,014.5 - 3,154.7 | m.r. |
| 2 | 9,890 - 10,300 | 100 ft w.c.m.<br>400 ft mud | 3,014.5 - 3,139.4 | 30.5 m w.c.m.<br>121.9 m mud |
| 3 | 5,820 - 5,865 | 90 ft g.c.m. | 1,773.9 - 1,787.7 | 27.4 m g.c.m. |
| 4 | 4,700 - 4,815 | 150 ft mud | 1,432.6 - 1,467.6 | 45.7 m mud |
| 5 | 4,530 - 4,640 | 150 ft mud | 1,380.7 - 1,414.3 | 45.7 m mud |

***Completed Intervals*** ..... ***NIL***

**Schedule of Wells**

| *Geologic Tops* | *FtKB* | *FtSS* | *mKB* | *mSS* |
|---|---|---|---|---|
| Tuttle Ss | surface | 1,625 | surface | 495.3 |
| Imperial | 677 | 948 | 206.3 | 289.0 |
| Canol/Hare Indian | 4,517 | -2,892 | 1,376.8 | -881.5 |
| Prongs Creek | 4,599 | -2,974 | 1,401.8 | -906.5 |
| Road River | 8,105 | -6,480 | 2,470.4 | -1,975.1 |
| Franklin Mt | 9,266 | -7,641 | 2,824.3 | -2,329.0 |
| Proterozoic | 11,264 | -9,639 | 3,433.3 | -2,938.0 |

**Peel Area Assessment**

| *Geologic Tops* | *FtKB* | *FtSS* | *mKB* | *mSS* |
|---|---|---|---|---|
| Tuttle | 1 | 1,624 | 0.3 | 495.0 |
| Imperial | 677 | 948 | 206.3 | 289.0 |
| Canol | 4,515 | -2,890 | 1,376.3 | -881.0 |
| Hume/Prongs Creek | 4,597 | -2,972 | 1,401.3 | -906.0 |
| Landry | 5,218 | -3,593 | 1,590.3 | -1,095.0 |
| Tatsieta | 8,032 | -6,407 | 2,448.3 | -1,953.0 |
| Peel/Road River | 8,105 | -6,480 | 2,470.3 | -1,975.0 |
| Mt Kindle | 8,551 | -6,926 | 2,606.3 | -2,111.0 |
| Franklin Mtn | 9,132 | -7,507 | 2,783.3 | -2,288.0 |
| Cherty | 9,430 | -7,805 | 2,874.3 | -2,379.0 |
| Proterozoic | 11,264 | -9,639 | 3,433.3 | -2,938.0 |

## SHELL – TRAIL RIVER YT H-37

Drilling Authority Number ..... 0728
Unique Well Identifier ..... 300H376640134450
Classification ..... New Field Wildcat
Latitude ..... 66°36'16.1" Longitude ..... 134°50'58.7"
Spud Date ..... 7-NOV-73 Rig Released ..... 26-MAR-74
Status ..... Dry and Abandoned
K.B. (ft) ..... 1,290, 393.2 m
T.D. (ft) ..... 12,210, 3721.6 m
Logs available ..... DIL,BHC-S-GR, FDC, HDT, PMLL, VL
Sample Intervals (ftKB) ..... 0 - 12,210, 0 - 3721.6 (mKB)

***Cored Intervals***

| Interval No. | (Ftkb) | (Mkb) |
|---|---|---|
| 1 | 8,585 - 8615 | 2,616.7 - 2,625.9 |

***DST/RFT/EFT Tests***

| Test No. | (Ftkb) | Results | (Mkb) | Results |
|---|---|---|---|---|
| 1 | 8,548 - 8,832 | 210 ft m mud | 2,605.4 - 2,692.0 | 64.0 m mud |
| 2 | 10,350 - 10,450 | m.r. | 3,154.7 - 3,185.2 | m.r. |
| 3 | 10,323 - 10,512 | 7.6 bbls wtr. | 3,146.5 - 3,204.1 | 7.6 m3 wtr. |

***Completed Intervals..... NIL***

**Schedule of Wells**

| *Geologic Tops* | *FtKB* | *FtSS* | *mKB* | *mSS* |
|---|---|---|---|---|
| Tuttle Ss | 2,120 | -830 | 646.2 | -253 |
| Imperial | 6,050 | -4,760 | 1,844.0 | -1,451 |
| Canol/Hare Indian | 8,860 | -7,570 | 2,700.5 | -2,307 |
| Hume | 8,872 | -7,582 | 2,704.2 | -2,311 |
| Gossage | 9,161 | -7,871 | 2,792.3 | -2,399 |
| L Ls mbr | 11,438 | -10,148 | 3,486.3 | -3,093 |
| Ronning Gp | 11,521 | -10,231 | 3,511.6 | -3,118 |

**Peel Area Assessment**

| *Geologic Tops* | *FtKB* | *FtSS* | *mKB* | *mSS* |
|---|---|---|---|---|
| Tuttle | 2,117 | -827 | 645.2 | -252.0 |
| Imperial | 6,047 | -4,757 | 1,843.2 | -1,450.0 |
| Canol | 8,856 | -7,566 | 2,699.2 | -2,306.0 |
| Bluefish | ABS | ABS | ABS | ABS |
| Hume | 8,869 | -7,579 | 2,703.2 | -2,310.0 |
| Landry | 9,157 | -7,867 | 2,791.2 | -2,398.0 |
| Arnica | ABS | ABS | ABS | ABS |
| Tatsieta | 11,434 | -10,144 | 3,485.2 | -3,092.0 |
| Peel | 11,516 | -10,226 | 3,510.2 | -3,117.0 |

## AMOCO PCP B-1 – CRANSWICK YT A-42

| | | | |
|---|---|---|---|
| Drilling Authority Number | 0597 | | |
| Unique Well Identifier | 300A426550133000 | | |
| Classification | New Field Wildcat | | |
| Latitude | 65°41'12.6" | Longitude | 133°07'52.1" |
| Spud Date | 14-APR-72 | Rig Released | 20-Mar-73 |
| Status | Dry and Abandoned | | |
| K.B. (ft) | 2,034 | 620.0 | m |
| T.D. (ft) | 14,000 | 4267.2 | m |
| Logs available | DILL, BHCS, CDM, SNP, FD, IES, MLL | | |
| Sample Intervals (ftKB) | 70 - 14,000 | 21.3 - 4267.2 | (mKB) |

***Cored Intervals***

| Interval No. | (Ftkb) | (Mkb) |
|---|---|---|
| | Nil | |

***DST/RFT/EFT Tests***

| Test No. | (Ftkb) | Results | (Mkb) | Results |
|---|---|---|---|---|
| 1 | 7,125 - 7,252 | 180 ft mud | 2,171.7 - 2,210.4 | 54.9 m mud |
| 2 | 8,238 - 8,313 | m.r. | 2,510.9 - 2,533.8 | m.r. |
| 3 | 8,695 - 8,900 | m.r. | 2,650.2 - 2,712.7 | m.r. |
| 4 | 10,931 - 11,045 | m.r. | 3,331.8 - 3,366.5 | m.r. |
| 5 | 11,257 - 11,400 | m.r. | 3,431.1 - 3,474.7 | m.r. |
| 6 | 11,271 - 11,400 | m.r. | 3,435.4 - 3,474.7 | m.r. |

***Completed Intervals..... NIL***

**Schedule of Wells**

| *Geologic Tops* | *FtKB* | *FtSS* | *mKB* | *mSS* |
|---|---|---|---|---|
| Cret | surface | 2,034 | surface | 620 |
| Tuttle Ss | 3,680 | -1,646 | 1,121.7 | -502 |
| Imperial | 6,300 | -4,266 | 1,920.2 | -1,300 |
| Canol/Hare Indian | 6,916 | -4,882 | 2,108.0 | -1,488 |
| Hume | 7,088 | -5,054 | 2,160.4 | -1,540 |
| Gossage Ls mbr | 8,364 | -6,330 | 2,549.3 | -1,929 |
| Dol Mbr | 9,863 | -7,829 | 3,006.2 | -2,386 |
| L Ls mbr | 9,996 | -7,962 | 3,046.8 | -2,427 |
| Ronning Gp | 10,269 | -8,235 | 3,130.0 | -2,510 |
| Mount Kindle | 10,990 | -8,956 | 3,349.8 | -2,730 |
| Franklin Mountain | 11,752 | -9,718 | 3,582.0 | -2,962 |
| Chty Mbr | 12,324 | -10,290 | 3,756.4 | -3,136 |

**Peel Area Assessment**

| *Geologic Tops* | *FtKB* | *FtSS* | *mKB* | *mSS* |
|---|---|---|---|---|
| Tuttle | 3,635 | -1,601 | 1,108.1 | -488 |
| Imperial | 6,231 | -4,197 | 1,899.1 | -1,279 |
| Canol | 6,916 | -4,882 | 2,108.1 | -1,488 |
| Bluefish | 7,061 | -5,027 | 2,152.1 | -1,532 |
| Hume | 7,087 | -5,053 | 2,160.1 | -1,540 |
| Landry | 8,363 | -6,329 | 2,549.1 | -1,929 |
| Arnica | 9,863 | -7,829 | 3,006.1 | -2,386 |
| Tatsieta | 9,997 | -7,963 | 3,047.1 | -2,427 |
| Peel | 10,269 | -8,235 | 3,130.1 | -2,510 |
| Mt Kindle | 10,991 | -8,957 | 3,350.1 | -2,730 |
| Franklin Mtn | 11,752 | -9,718 | 3,582.1 | -2,962 |
| Cherty | 12,323 | -10,289 | 3,756.1 | -3,136 |

## SKELLY-GETTY MOBIL – ARCTIC RED YT C-60

Drilling Authority Number ..... 0534
Unique Well Identifier ..... 300C606650133450
Classification ..... New Field Wildcat
Latitude ..... 66°49'00.0" Longitude ..... 133°55'19.0"
Spud Date ..... 15-JAN-72 Rig Released ..... 26-MAR-72
Status ..... Dry and Abandoned
K.B. (ft) ..... 302, 92.0 m
T.D. (ft) ..... 8,530, 2599.9 m
Logs available ..... BHC-S, DILL, SNP, FD
Sample Intervals (ftKB) ..... 20 - 8530, 6.1 - 2599.9 (mKB)

***Cored Intervals***

| Interval No. | (Ftkb) | (Mkb) |
|---|---|---|
| 1 | 6,742 - 6,798 | 2,055.0 - 2,072.0 |

***DST/RFT/EFT Tests***

| Test No. | (Ftkb) | Results | (Mkb) | Results |
|---|---|---|---|---|
| 1 | 7,826 - 8,025 | 180 ft mud | 2,385.4 - 2,446.0 | 54.9 m mud |
| 2 | 7,340 - 7,390 | m.r | 2,237.2 - 2,252.5 | m.r |
| 3 | 7,826 - 8,025 | m.r | 2,385.4 - 2,446.0 | m.r |
| 4 | 7,822 - 8,025 | m.r | 2,384.1 - 2,445.0 | m.r |
| 5 | 7,340 - 7,390 | m.r | 2,237.2 - 2,252.5 | m.r |
| 6 | 7,358 - 7,388 | 270 ft mud, 3256 ft s.w. | 2,242.7 - 2,251.9 | 82.3 m mud, 992.4 s.w. |
| 7 | 7,802 - 8,165 | 510 ft mud | 2,378.0 - 2,488.7 | 155.4 m mud |

***Completed Intervals..... NIL***

**Schedule of Wells**

| *Geologic Tops* | *FtKB* | *FtSS* | *mKB* | *mSS* |
|---|---|---|---|---|
| Tuttle Ss | 516 | -214 | 157.3 | -65 |
| Imperial | 632 | -330 | 192.6 | -101 |
| Canol/Hare Indian | 5,262 | -4,960 | 1,603.9 | -1,512 |
| Hume | 5,489 | -5,187 | 1,673.0 | -1,581 |
| Gossage Ls mbr | 5,834 | -5,532 | 1,778.2 | -1,686 |
| L Ls mbr | 7,542 | -7,240 | 2,298.8 | -2,207 |
| Ronning Gp | 7,646 | -7,344 | 2,330.5 | -2,239 |

| *Geologic Tops* | *FtKB* | *FtSS* | *mKB* | *mSS* |
|---|---|---|---|---|
| Tuttle | 515.1 | -213 | 157.0 | -65 |
| Imperial | 633.2 | -331 | 193.0 | -101 |
| Canol | 5,262.5 | -4,960 | 1,604.0 | -1,512 |
| Bluefish | 5,475.7 | -5,174 | 1,669.0 | -1,577 |
| Hume | 5,488.8 | -5,187 | 1,673.0 | -1,581 |
| Landry | 5,833.3 | -5,531 | 1,778.0 | -1,686 |
| Arnica | 7,135.8 | -6,834 | 2,175.0 | -2,083 |
| Tatsieta | 7,542.7 | -7,241 | 2,299.0 | -2,207 |
| Peel | 7,644.4 | -7,342 | 2,330.0 | -2,238 |

## MCD GCO NORTHUP – TAYLOR LAKE YT K-15

Drilling Authority Number ..... 0330
Unique Well Identifier ..... 300K156600133000
Classification ..... New Field Wildcat
Latitude ..... 65°54'39.0" Longitude ..... 133°03'00.0"
Spud Date ..... 05-FEB-69 Rig Released ..... 29-MAR-69
Status ..... Dry and Abandoned
K.B. (ft) ..... 1,538 468.8 ..... m
T.D. (ft) ..... 7,804 2378.7 ..... m
Logs available ..... IES, BHC-S, CDM, FDC, VL
Sample Intervals (ftKB) ..... 10 - 7800, 3 - 2377.4 (mKB)

***Cored Intervals***

| Interval No. | (Ftkb) | (Mkb) |
|---|---|---|
| | Nil | Nil |

***DST/RFT/EFT Tests***

| Test No. | (Ftkb) | Results | (Mkb) | Results |
|---|---|---|---|---|
| 1 | 2,393 - 2,418 | 100 ft watery mud, 400 ft mdy gsy fr wtr | 729.4 - 737.0 | 30.5 m watery mud, 121.9 m mdy gsy fr wtr |
| 2 | 2,824 - 3,003 | 330 ft mud, 1,240 ft fr wtr | 860.8 - 915.3 | 100.6 m mud, 378.0 m fr wtr |
| 3 | 5,880 - 6,076 | 450 ft wtr and mud, 1,190 ft gsy s w. | 792.2 - 1,852.0 | 137.2 m wtr and mud, 362.7 m gsy s w. |
| 4 | 7,390 - 7,804 | 910 ft s.w.c. mud | 2,252.5 - 2,378.7 | 277.4 m s.w.c. mud |
| 5 | 5,640 - 5,704 | 1,270 ft s.w. | 1,719.1 - 1,738.6 | 387.1 m s.w. |

***Completed Intervals..... NIL***

**Schedule of Wells**

| *Geologic Tops* | *FtKB* | *FtSS* | *mKB* | *mSS* |
|---|---|---|---|---|
| Arctic Red | surface | 1,538 | surface | 469 |
| Martin House | 2,074 | -536 | 632.2 | -163 |
| Tuttle Ss | 2,106 | -568 | 641.9 | -173 |
| Imperial | 3,452 | -1,914 | 1,052.2 | -583 |
| Canol/Hare Indian | 4,312 | -2,774 | 1,314.3 | -846 |
| Hume | 4,454 | -2,916 | 1,357.6 | -889 |
| Gossage | 5,000 | -3,462 | 1,524.0 | -1,055 |
| L Ls mbr | 6,750 | -5,212 | 2,057.4 | -1,589 |
| Ronning Gp | 6,882 | -5,344 | 2,097.6 | -1,629 |
| Mount Kindle | 7,600 | -6,062 | 2,316.5 | -1,848 |

**Peel Area Assessment**

| *Geologic Tops* | *FtKB* | *FtSS* | *mKB* | *mSS* |
|---|---|---|---|---|
| Tuttle | 2,106 | -568 | 641.8 | -173.0 |
| Imperial | 3,451 | -1,913 | 1,051.8 | -583.0 |
| Canol | 4,314 | -2,776 | 1,314.8 | -846.0 |
| Bluefish | 4,438 | -2,900 | 1,352.8 | -884.0 |
| Hume | 4,455 | -2,917 | 1,357.8 | -889.0 |
| Landry | 4,999 | -3,461 | 1,523.8 | -1,055.0 |
| Arnica | 6,249 | -4,711 | 1,904.8 | -1,436.0 |
| Tatsieta | 6,751 | -5,213 | 2,057.8 | -1,589.0 |
| Peel | 6,883 | -5,345 | 2,097.8 | -1,629.0 |
| Mt Kindle | 7,601 | -6,063 | 2,316.8 | -1,848.0 |

## SHELL – PEEL RIVER YT M-69

Drilling Authority Number ..... 0769
Unique Well Identifier ..... 300M696610133450
Classification ..... New Field Wildcat
Latitude ..... 66°08'56.0" Longitude ..... 133°58'04.0"
Spud Date ..... 6-OCT-74 Rig Released ..... 04-DEC-74
Status ..... Dry and Abandoned
K.B. (ft) ..... 957, 291.7 m
T.D. (ft) ..... 10,737, 3272.6 m
Logs available ..... GR, DIL, CNL/FDC, HDT, PML
Sample Intervals (ftKB) ..... 1280 - 10730, 390.1 - 3270.5 (mKB)

***Cored Intervals***

| Interval No. | (Ftkb) | (Mkb) |
|---|---|---|
| 1 | 8,554 - 8,634 | 2,607.3 - 2,631.6 |

***DST/RFT/EFT Tests***

| Test No. | (Ftkb) | Results | (Mkb) | Results |
|---|---|---|---|---|
| 1 | 10,272 - 10,343 | m.r. | 3,130.9 - 3,152.5 | m.r. |
| 2 | 10,222 - 10,324 | m.r. | 3,115.7 - 3,146.8 | m.r. |
| 3 | 10,183 - 10,737 | 348 ft mud | 3,103.8 - 3,272.6 | 106.1 m mud |
| 4 | 5,718 - 5,905 | 310 ft mud, GTS TSTM | 1,742.8 - 1,799.8 | 94.5 m mud, GTS TSTM5 |
| 5 | 505 - 5,658 | 310 ft mud | 1,677.9 - 1,724.6 | 94.5 m mud |

***Completed Intervals..... NIL***

**Schedule of Wells**

| *Geologic Tops* | *FtKB* | *FtSS* | *mKB* | *mSS* |
|---|---|---|---|---|
| Tuttle Ss | 3,062 | -2,105 | 933.3 | -641.6 |
| Imperial | 5,952 | -4,995 | 1,814.2 | -1,522.5 |
| Canol/Hare Indian | 7,449 | -6,492 | 2,270.5 | -1,978.8 |
| Hume | 7,546 | -6,589 | 2,300.0 | -2,008.3 |
| Gossage | 7,975 | -7,018 | 2,430.8 | -2,139.1 |
| Dol Mbr | 9,950 | -8,993 | 3,032.8 | -2,741.1 |
| L Ls mbr | 10,106 | -9,149 | 3,080.3 | -2,788.6 |
| Ronning Gp | 10,254 | -9,297 | 3,125.4 | -2,833.7 |

**Peel Area Assessment**

| *Geologic Tops* | *FtKB* | *FtSS* | *mKB* | *mSS* |
|---|---|---|---|---|
| Tuttle | 3,063 | -2,106 | 933.7 | -642.0 |
| Imperial | 5,950 | -4,993 | 1,813.7 | -1,522.0 |
| Canol | 7,450 | -6,493 | 2,270.7 | -1,979.0 |
| Bluefish | 7,532 | -6,575 | 2,295.7 | -2,004.0 |
| Hume | 7,545 | -6,588 | 2,299.7 | -2,008.0 |
| Landry | 7,975 | -7,018 | 2,430.7 | -2,139.0 |
| Arnica | 9,950 | -8,993 | 3,032.7 | -2,741.0 |
| Tatsieta | 10,107 | -9,150 | 3,080.7 | -2,789.0 |
| Peel | 10,255 | -9,298 | 3,125.7 | -2,834.0 |

## MOBIL GULF – PEEL RIVER YT H-71

Drilling Authority Number ..... 0869
Unique Well Identifier ..... 300H716630134300
Classification ..... New Field Wildcat
Latitude ..... 66°20'28.6" Longitude ..... 134°43'34.6"
Spud Date ..... 03-FEB-77 Rig Released ..... 12-JUN-77
Status ..... Dry and Abandoned
K.B. (ft) ..... 1,680, 512.1 m
T.D. (ft) ..... 11,129, 3392.1 m
Logs available ..... DIL-SP, BHC-S-GR, CAL, CNL-FDC, DIP
Sample Intervals (ftKB) ..... 0 - 11,129, 0 - 3392.1 (mKB)

***Cored Intervals***

| Interval No. | (Ftkb) | (Mkb) |
|---|---|---|
| 1 | 10,455 - 10,486 | 3,186.7 - 3,196.1 |

***DST/RFT/EFT Tests***

| Test No. | (Ftkb) | Results | (Mkb) Results | |
|---|---|---|---|---|
| 1 | 9,415 - 9,475 | 4,000 ft w. cushion | 2,869.7 - 2,888.0 | 1,219.2 m w. cushion |
| 2 | 8,940 - 9,490 | 300 ft w cush., 2,230 ft s.w. | 2,724.9 - 2,892.6 | 91.0 m w cush., 679.9 m s.w. |

***Completed Intervals..... NIL***

**Schedule of Wells**

| *Geologic Tops* | *FtKB* | *FtSS* | *mKB* | *mSS* |
|---|---|---|---|---|
| Unnamed | 103 | 1577 | 31.4 | 480.7 |
| Imperial | 2,500 | -820 | 762.0 | -249.9 |
| Horn River | 6,060 | -4,380 | 1,847.1 | -1,335.0 |
| Hume | 6,162 | -4,482 | 1,878.2 | -1,366.1 |
| Landry | 6,634 | -4,954 | 2,022.0 | -1,509.9 |
| Unnamed | 8,641 | -6,961 | 2,633.8 | -2,121.7 |
| Unnamed | 8,700 | -7,020 | 2,651.8 | -2,139.7 |
| Mount Kindle | 9,130 | -7,450 | 2,782.8 | -2,270.7 |
| Franklin Mountain | 9,856 | -8,176 | 3,004.1 | -2,492.0 |
| Cherty Mbr | 10,400 | -8,720 | 3,169.9 | -2,657.8 |

**Peel Area Assessment**

| *Geologic Tops* | *FtKB* | *FtSS* | *mKB* | *mSS* |
|---|---|---|---|---|
| Tuttle | 102 | 1,578 | 31.0 | 481.1 |
| Imperial | 2,500 | -820 | 762.0 | -249.9 |
| Canol | 6,060 | -4,380 | 1,847.0 | -1,334.9 |
| Bluefish | ABS | ABS | ABS | ABS |
| Hume | 6,161 | -4,481 | 1,878.0 | -1,365.9 |
| Landry | 6,634 | -4,954 | 2,022.0 | -1,509.9 |
| Arnica | ABS | ABS | ABS | ABS |
| Tatsieta | 8,642 | -6,962 | 2,634.0 | -2,121.9 |
| Peel | 8,701 | -7,021 | 2,652.0 | -2,139.9 |
| Mt Kindle | 9,131 | -7,451 | 2,783.0 | -2,270.9 |
| Franklin Mtn | 9,856 | -8,176 | 3,004.0 | -2,491.9 |
| Cherty | 10,400 | -8,720 | 3,170.0 | -2,657.9 |

## PACIFIC ET AL. – PEEL RIVER YT F-37

Drilling Authority Number ..... 0547
Unique Well Identifier ..... 300F376700134450
Classification ..... New Field Wildcat
Latitude ..... 66°56'26.0" Longitude ..... 134°51'54.0"
Spud Date ..... 13-FEB-72 Rig Released ..... 20-APR-72
Status ..... Dry and Abandoned
K.B. (ft) ..... 179, 54.6 m
T.D. (ft) ..... 11,050, 3368.0 m
Logs available ..... SNP, DIL, FD, MC, BHC-S, VL
Sample Intervals (ftKB) (ftKB) ..... 78 - 11,050, 23.8 - 3368.0 (mKB)

***Cored Intervals***

| Interval No. | (Ftkb) | (Mkb) |
|---|---|---|
| | Nil | |

***DST/RFT/EFT Tests***

| Test No. | (Ftkb) | Results | (Mkb) | Results |
|---|---|---|---|---|
| 1 | 10,890 - 11,050 | 450 ft mud, 4,554 ft gsy s.w., 360 ft gsy mdy s.w., 30 ft mud | 3,319.3 - 3,368.0 | 137.2 m mud 13881.1 m gsy s.w., 109.7 m gsy mdy s.w., 9.1 m mud |
| 2 | 9,620 - 9,780 | 186 ft mud | 2,932.2 - 2,980.9 | 56.7 m mud |
| 3 | 8,950 - 9,170 | m.r. | 2,728.0 - 2,795.0 | m.r. |
| 4 | 1,428 - 1,630 | m.r. | 435.3 - 496.8 | m.r. |
| 5 | 9,110 - 9,320 | 210 ft mud | 2,776.7 - 2,840.7 | 64.0 m mud |
| 6 | 1,500 - 1,630 | 895 ft mdy wtr. | 457.2 - 496.8 | 272.8 m mdy wtr. |

***Completed Intervals..... NIL***

**Schedule of Wells**

| *Geologic Tops* | *FtKB* | *FtSS* | *mKB* | *mSS* |
|---|---|---|---|---|
| Cret | surface | 179 | surface | 54.6 |
| Tuttle Ss | 350 | -171 | 106.7 | -52.1 |
| Imperial | 3,216 | -3,037 | 980.2 | -925.6 |
| Canol/Hare Indian | 7,398 | -7,219 | 2,254.9 | -2,200.3 |
| Hume | 7,506 | -7,327 | 2,287.8 | -2,233.2 |
| Gossage | 7,848 | -7,669 | 2,392.1 | -2,337.5 |
| L Ls mbr | 9,668 | -9,489 | 2,946.8 | -2,892.2 |
| Ronning Gp | 9,793 | -9,614 | 2,984.9 | -2,930.3 |
| Mount Kindle | 10,940 | -10,761 | 3,334.5 | -3,279.9 |

**Peel Area Assessment**

| *Geologic Tops* | *FtKB* | *FtSS* | *mKB* | *mSS* |
|---|---|---|---|---|
| Tuttle | 350 | -171 | 106.6 | -52.0 |
| Imperial | 3,217 | -3,038 | 980.6 | -926.0 |
| Canol | 7,397 | -7,218 | 2,254.6 | -2,200.0 |
| Bluefish | 7,499 | -7,320 | 2,285.6 | -2,231.0 |
| Hume | 7,505 | -7,326 | 2,287.6 | -2,233.0 |
| Landry | 7,850 | -7,671 | 2,392.6 | -2,338.0 |
| Arnica | 9,270 | -9,091 | 2,825.6 | -2,771.0 |
| Tatsieta | 9,667 | -9,488 | 2,946.6 | -2,892.0 |
| Peel | 9,792 | -9,613 | 2,984.6 | -2,930.0 |

## TOLTEC – PEEL RIVER YT N-77

Drilling Authority Number ..... 0321
Unique Well Identifier ..... 300N776600134150
Classification ..... New Field Wildcat
Latitude ..... 65°56'46.0" Longitude ..... 134°29'12.0"
Spud Date ..... 07-OCT-68 Rig Released ..... 23-Jul-70
Status ..... Dry and Abandoned
K.B. (ft) ..... 487, 148.4 m
T.D. (ft) ..... 3,686, 1123.5 m
Logs available ..... NIL
Sample Intervals (ftKB) ..... Not available

***Cored Intervals***

| Interval No. | (Ftkb) | (Mkb) |
|---|---|---|
| 1 | 985 - 3,686 | 300.2 - 1,123.5 |

***DST/RFT/EFT Tests***

| Test No. | (Ftkb) | Results | (Mkb) | Results |
|---|---|---|---|---|
| None run | | | | |

***Completed Intervals..... NIL***

**Schedule of Wells**

| *Geologic Tops* | *FtKB* | *FtSS* | *mKB* | *mSS* |
|---|---|---|---|---|
| Imperial | surface | 487 | surface | 148 |
| Prongs Creek | 565 | -78 | 172.2 | -24 |

**Peel Area Assessment**

| *Geologic Tops* | *FtKB* | *FtSS* | *mKB* | *mSS* |
|---|---|---|---|---|
| Tuttle | ABS | ABS | ABS | ABS |
| Imperial | 1 | 486 | 0.4 | 148.0 |
| Canol | UNKNOWN | UNKNOWN | UNKNOWN | UNKNOWN |
| Bluefish | UNKNOWN | UNKNOWN | UNKNOWN | UNKNOWN |
| Hume/Prongs Creek | 566 | -79 | 172.4 | -24.0 |
| Landry | 1,586 | -1,099 | 483.4 | -335.0 |

## SHELL – PEEL RIVER YT H-59

Drilling Authority Number ..... 0266
Unique Well Identifier ..... 300H596640134300
Classification ..... New Field Wildcat
Latitude ..... 66°38'17.9" Longitude ..... 134°39'33.1"
Spud Date ..... 13-MAR-67 Rig Released ..... 01-APR-67
Status ..... Dry and Abandoned
K.B. (ft) ..... 110, 33.5 m
T.D. (ft) ..... 2,504, 763.2 m
Logs available ..... IES, MC, FDC-GR,BHC-S-GR
Sample Intervals (ftKB) ..... 430 - 2504, 131.1 - 763.2 (mKB)

***Cored Intervals***

| Interval No. | (Ftkb) | (Mkb) |
|---|---|---|
| 1 | 1,899 - 1,929 | 578.8 - 588.0 |

***DST/RFT/EFT Tests***

| Test No. | (Ftkb) | Results | (Mkb) | Results |
|---|---|---|---|---|
| 1 | 1,940 - 2,140 | 300 ft wtr | 591.3 - 652.3 | 91.4 m wtr |

***Completed Intervals..... NIL***

**Schedule of Wells**

| *Geologic Tops* | *FtKB* | *FtSS* | *mKB* | *mSS* |
|---|---|---|---|---|
| Cret Sh, Ss | surface | 110 | surface | 33.5 |
| Tuttle Ss | 970 | -860 | 295.7 | -262.2 |

**Peel Area Assessment**

| *Geologic Tops* | *FtKB* | *FtSS* | *mKB* | *mSS* |
|---|---|---|---|---|
| Tuttle | 969 | -859 | 295.4 | -261.9 |

## IOE – SATAH RIVER YT G-72

Drilling Authority Number ..... 0240
Unique Well Identifier ..... 300G726700134000
Classification ..... New Field Wildcat
Latitude ..... 66°51'28.0" Longitude ..... 134°13'57.0"
Spud Date ..... 13-JAN-67 Rig Released ..... 09-MAR-67
Status ..... Dry and Abandoned
K.B. (ft) ..... 294, 89.6 m
T.D. (ft) ..... 7,500, 2286.0 m
Logs available ..... IES, MC, VL, BHC-S-GRC
Sample Intervals (ftKB) ..... 30 - 7500, 9.1 - 2286.0 (mKB)

***Cored Intervals***

| Interval No. | (Ftkb) | (Mkb) |
|---|---|---|
| 1 | 6,500 - 6,535 | 1,981.2 - 1,991.9 |

***DST/RFT/EFT Tests***

| Test No. | (Ftkb) | Results | (Mkb) | Results |
|---|---|---|---|---|
| None | | | | |

***Completed Intervals..... NIL***

**Schedule of Wells**

| *Geologic Tops* | *FtKB* | *FtSS* | *mKB* | *mSS* |
|---|---|---|---|---|
| Cret siltst and sh | 30 | 264 | 9.1 | 80.5 |
| Tuttie Ss | 550 | -256 | 167.6 | -78.0 |
| Imperial | 960 | -666 | 292.6 | -203.0 |
| Canol/Hare Indian | 5,920 | -5,626 | 1,804.4 | -1,714.8 |
| Hume | 6,151 | -5,857 | 1,874.8 | -1,785.2 |
| Gossage | 6,492 | -6,198 | 1,978.8 | -1,889.2 |

**Peel Area Assessment**

| *Geologic Tops* | *FtKB* | *FtSS* | *mKB* | *mSS* |
|---|---|---|---|---|
| Tuttle | 550 | -256 | 167.6 | -78.0 |
| Imperial | 960 | -666 | 292.6 | -203.0 |
| Canol | 5,921 | -5,627 | 1,804.6 | -1,715.0 |
| Bluefish | 6,131 | -5,837 | 1,868.6 | -1,779.0 |
| Hume | 6,150 | -5,856 | 1,874.6 | -1,785.0 |
| Landry | 6,491 | -6,197 | 1,978.6 | -1,889.0 |

## SHELL – PEEL RIVER YT K-09

Drilling Authority Number ..... 0257
Unique Well Identifier ..... 300K096620134000
Classification ..... New Field Wildcat
Latitude ..... 66°18'35.7" Longitude ..... 134°01'02.2"
Spud Date ..... 06-FEB-67 Rig Released ..... 07-MAR-67
Status ..... Dry and Abandoned
K.B. (ft) ..... 1,147, 349.6 m
T.D. (ft) ..... 5,100, 1554.5 m
Logs available ..... IES, MC, BHC-S, FDC, SRS
Sample Intervals (ftKB) ..... 300 - 5,100, 91.4 - 1554.8 (mKB)

***Cored Intervals***

| Interval No. | (Ftkb) | (Mkb) |
|---|---|---|
| 1 | 4,390 - 4,397 | 1,338.1 - 1,340.2 |

***DST/RFT/EFT Tests***

| Test No. | (Ftkb) | Results | (Mkb) Results |
|---|---|---|---|
| 1 | 3,610 - 4,010 | 120 ft mud | 1,100.3 - 1,222.4 36.6 m mud |
| 2 | 4,374 - 4,459 | 500 ft mud, 300 ft s.w. | 1,333.2 - 1,359.1 152.4 m mud, 91.4 m s.w. |

***Completed Intervals*** ..... ***NIL***

**Schedule of Wells**

| *Geologic Tops* | *FtKB* | *FtSS* | *mKB* | *mSS* |
|---|---|---|---|---|
| Cret glauconitic sh | surface | 1,147 | surface | 349.6 |
| Tuttle Ss | 2,792 | -1,645 | 851.0 | -501.4 |

**Peel Area Assessment**

| *Geologic Tops* | *FtKB* | *FtSS* | *mKB* | *mSS* |
|---|---|---|---|---|
| Tuttle | 2,790 | -1,643 | 850.5 | -500.9 |

## SHELL — PEEL RIVER YT J-21

Drilling Authority Number ..... 0183
Unique Well Identifier ..... 300J216640134000
Classification ..... New Field Wildcat
Latitude ..... 66°30'31.9" Longitude ..... 134°04'23.3"
Spud Date ..... 31-JUL-65 Rig Released ..... 01-SEP-65
Status ..... Dry and Abandoned
K.B. (ft) ..... 150, 45.7 m
T.D. (ft) ..... 4,000, 1219.2 m
Logs available ..... IES, SGR, MLC, FD, SRS
Sample Intervals (ftKB) ..... 400 - 4,000, 121.9 to 1219.2 (mKB)

***Cored Intervals***

| Interval No. | (Ftkb) | (Mkb) |
|---|---|---|
| 1 | 2,017 - 2,027 | 614.8 - 617.8 |
| 2 | 2,934 - 3,944 | 894.3 - 1,202.1 |

***DST/RFT/EFT Tests***

| Test No. | (Ftkb) | Results | (Mkb) | Results |
|---|---|---|---|---|
| 1 | 2,720 - 2,792 | 295 ftm.c.s.w. | 829.1 - 851.0 | 89.9 mm.c.s.w. |

***Completed Intervals..... NIL***

**Schedule of Wells**

| *Geologic Tops* | *FtKB* | *FtSS* | *mKB* | *mSS* |
|---|---|---|---|---|
| Glauc. Ss & Siltst | 1,060 | -910 | 323.1 | -277.4 |
| Siltst & Sh | 1,080 | -930 | 329.2 | -283.5 |
| Tuttle Ss | 1,164 | -1,014 | 354.8 | -309.1 |

**Peel Area Assessment**

| *Geologic Tops* | *FtKB* | *FtSS* | *mKB* | *mSS* |
|---|---|---|---|---|
| Tuttle | 1,118 | -968 | 340.7 | -295.0 |

## SHELL – PEEL RIVER YT K-76

Drilling Authority Number ..... 0203
Unique Well Identifier ..... 300K766630134000
Classification ..... New Field Wildcat
Latitude ..... 66°25'35.4" Longitude ..... 134°14'07.9"
Spud Date ..... 07-OCT-65 Rig Released ..... 25-NOV-65
Status ..... Dry and Abandoned
K.B. (ft) ..... 251, 76.5 m
T.D. (ft) ..... 4,550, 1386.8 m
Logs available ..... IES, MLC, BHC-SGR, SRS, FDC
Sample Intervals (ftKB) ..... 40 - 4,550, 12.2 to 1386.8 (mKB)

***Cored Intervals***

| Interval No. | (Ftkb) | (Mkb) |
|---|---|---|
| | No Conventional | |

***DST/RFT/EFT Tests***

| Test No. | (Ftkb) | Results | (Mkb) | Results |
|---|---|---|---|---|
| 1 | 3,750 - 3,901 | 60 ft mud, 110 ft water | 1,143.0 - 1,189.0 | 18.3 m mud, 33.5 m water |

***Completed Intervals..... NIL***

**Schedule of Wells**

| *Geologic Tops* | *FtKB* | *FtSS* | *mKB* | *mSS* |
|---|---|---|---|---|
| Glauc. Ss & Siltst | 1,427 | -1 176 | 434.9 | -358.4 |
| Siltst & Sh | 1,450 | -1,199 | 442.0 | -365.5 |
| Tuttle Ss | 1,479 | -1,228 | 450.8 | -374.3 |

**Peel Area Assessment**

| *Geologic Tops* | *FtKB* | *FtSS* | *mKB* | *mSS* |
|---|---|---|---|---|
| Tuttle | 1,478 | -1,227 | 450.5 | -374.0 |

## SHELL – PEEL RIVER YT L-01

Drilling Authority Number ..... 0210
Unique Well Identifier ..... 300L016640134450
Classification ..... New Field Wildcat
Latitude ..... 66°30'38.3" Longitude ..... 134°46'28.5"
Spud Date ..... 12-DEC-65 Rig Released ..... 07-FEB-66
Status ..... Dry and Abandoned
K.B. (ft) ..... 1,295, 394.7 m
T.D. (ft) ..... 6,020, 1834.9 m
Logs available ..... IES, FDC, BHC-S, SRS
Sample Intervals (ftKB) ..... 40 - 6,020, 12.2 to 1834.9 (mKB)

***Cored Intervals***

| Interval No. | (Ftkb) | (Mkb) |
|---|---|---|
| 1 | 4,315 - 4,335 | 1,315.2 - 1,321.3 |
| 2 | 4,455 - 4,485 | 1,357.9 - 1,367.0 |
| 3 | 5,026 - 6,056 | 1,531.9 - 1,845.9 |

***DST/RFT/EFT Tests***

| Test No. | (Ftkb) | Results | (Mkb) | Results |
|---|---|---|---|---|
| 1 | 4,392 - 4,574 | 3,000 ftm.c.w. | 1,338.7 - 1,394.2 | 914.4 mm.c.w. |
| 2 | 3,010 - 3,188 | 130 ft mud | 917.4 - 971.7 | 39.5 m mud |

***Completed Intervals..... NIL***

**Schedule of Wells**

| *Geologic Tops* | *FtKB* | *FtSS* | *mKB* | *mSS* |
|---|---|---|---|---|
| Meso Ss, Sh | 480 | 815 | 146.3 | 248.4 |
| Sh sltst | 610 | 685 | 185.9 | 208.8 |
| Siltst & Sh | 1,060 | 235 | 323.1 | 71.6 |
| Ss, Sh | 1,160 | 135 | 353.6 | 41.1 |
| Sh, Ironst, glauc sltst | 1,260 | 35 | 384.0 | 10.7 |
| Tuttle Ss | 2,240 | -945 | 682.8 | -288.1 |
| Imperial | 5,859 | -4,564 | 1,785.8 | -1,391.1 |

**Peel Area Assessment**

| *Geologic Tops* | *FtKB* | *FtSS* | *mKB* | *mSS* |
|---|---|---|---|---|
| Tuttle | 2,240 | -945 | 682.7 | -288.0 |
| Imperial | 5,859 | -4,564 | 1,785.7 | -1,391.0 |

## SHELL – PEEL RIVER YT I-21

Drilling Authority Number ..... 0230
Unique Well Identifier ..... 300I216620134150
Classification ..... New Field Wildcat
Latitude ..... 66°10'36.5" Longitude ..... 134°18'52.1"
Spud Date ..... 20-FEB-66 Rig Released ..... 30-MAR-66
Status ..... Dry and Abandoned
K.B. (ft) ..... 1,251, 381.3 m
T.D. (ft) ..... 6,800, 2072.6 m
Logs available ..... IES, FDC, MLC, BHC-S, SRS
Sample Intervals (ftKB) ..... 70 - 6,800, 21.3 - 2072.6 (mKB)

***Cored Intervals***

| Interval No. | (Ftkb) | (Mkb) |
|---|---|---|
| 1 | 5,850 - 5,885 | 1,783.1 - 1,793.7 |
| 2 | 6,194 - 6,224 | 1,887.9 - 1,897.1 |
| 3 | 6,470 - 6,500 | 1,972.1 - 1,981.2 |
| 4 | 6,790 - 6,800 | 2,069.6 - 2,072.6 |

***DST/RFT/EFT Tests***

| Test No. | (Ftkb) | Results | (Mkb) | Results |
|---|---|---|---|---|
| 1 | 2,194 - 2,331 | 30 ft mud | 668.7 - 710.5 | 9.1 m mud |
| 2 | 2,518 - 2,916 | 1,373 ft fr.wtr. | 767.5 - 888.8 | 418.5 m fr.wtr. |
| 3 | 4,542 - 4,878 | 20 ft mud | 1,384.4 - 1,486.8 | 6.1 m mud |

***Completed Intervals..... NIL***

**Schedule of Wells**

| *Geologic Tops* | *FtKB* | *FtSS* | *mKB* | *mSS* |
|---|---|---|---|---|
| Tuttle Ss | surface | 1,251 | surface | 381.3 |
| Imperial | 2,918 | -1,667 | 889.4 | -508.1 |
| Canol/Hare Indian | 4,636 | -3,385 | 1,413.1 | -1,031.8 |
| Hume | 4,763 | -3,512 | 1,451.8 | -1,070.5 |
| Gossage | 5,156 | -3,905 | 1,571.5 | -1,190.2 |

**Peel Area Assessment**

| *Geologic Tops* | *FtKB* | *FtSS* | *mKB* | *mSS* |
|---|---|---|---|---|
| Tuttle | 70 | 1,181 | 21.2 | 360.1 |
| Imperial | 2,917 | -1,666 | 889.2 | -507.9 |
| Canol | 4,636 | -3,385 | 1,413.2 | -1,031.9 |
| Bluefish | 4,745 | -3,494 | 1,446.2 | -1,064.9 |
| Hume | 4,761 | -3,510 | 1,451.2 | -1,069.9 |
| Landry | 5,155 | -3,904 | 1,571.2 | -1,189.9 |

## SHELL – PEEL RIVER YT L-19

Drilling Authority Number ..... 0233
Unique Well Identifier ..... 300L196650135150
Classification ..... New Field Wildcat
Latitude ..... 66°48'39.3" Longitude ..... 135°18'23.7"
Spud Date ..... 11-APR-66 Rig Released ..... 12-JUN-66
Status ..... Dry and Abandoned
K.B. (ft) ..... 312, 95.1 m
T.D. (ft) ..... 6,500, 1981.2 m
Logs available ..... IES, FDC, MLC, SRS, BHC-SGR
Sample Intervals (ftKB) ..... 0 - 6,500, 0 - 1981.2 (mKB)

***Cored Intervals***

| Interval No. | (Ftkb) | (Mkb) |
|---|---|---|
| | No convential core | |

***DST/RFT/EFT Tests***

| Test No. | (Ftkb) | Results | (Mkb) | Results |
|---|---|---|---|---|
| 1 | 3,264 - 3,323 | 800 ft fr. Wtr | 994.9 - 1,012.9 | 243.8 m fr. Wtr |

***Completed Intervals..... NIL***

**Schedule of Wells**

| *Geologic Tops* | *FtKB* | *FtSS* | *mKB* | *mSS* |
|---|---|---|---|---|
| Tuttle Ss | surface | 312 | surface | 95.1 |
| Imperial | 3,428 | -3,116 | 1,044.9 | -949.8 |

**Peel Area Assessment**

| *Geologic Tops* | *FtKB* | *FtSS* | *mKB* | *mSS* |
|---|---|---|---|---|
| Tuttle | 20 | 292 | 6.1 | 89.0 |
| Imperial | 3,429 | -3,117 | 1,045.1 | -950.0 |

## SHELL – PEEL RIVER YT B-06

Drilling Authority Number ..... 0237
Unique Well Identifier ..... 300B066640134450
Classification ..... New Field Wildcat
Latitude ..... 66°35'09.4" Longitude ..... 134°45'37.5"
Spud Date ..... 14-DEC-66 Rig Released ..... 31-DEC-66
Status ..... Dry and Abandoned
K.B. (ft) ..... 214, 65.2 m
T.D. (ft) ..... 1,412, 430.4 m
Logs available ..... IES, SGR, MLC, FD, SRS
Sample Intervals (ftKB) ..... 10 - 1,412, 3.0 - 430.4 (mKB)

***Cored Intervals***

| Interval No. | (Ftkb) | (Mkb) |
|---|---|---|
| | NIL | NIL |

***DST/RFT/EFT Tests***

| Test No. | (Ftkb) | Results | (Mkb) | Results |
|---|---|---|---|---|
| 1 | 1,035 - 1,412 | 80 ft mud | 315.5 - 430.4 | 24.4 m mud |
| 2 | 1,025 - 1,412 | GTS in 30 Sec, TSTM 120 ft g.c.w. | 312.4 - 430.4 | GTS in 30 Sec, TSTM 36.6 m g.c.w. |

***Completed Intervals..... NIL***

**Schedule of Wells**

| *Geologic Tops* | *FtKB* | *FtSS* | *mKB* | *mSS* |
|---|---|---|---|---|
| L Cret Sh, Sltst | surface | 214 | surface | 65.2 |
| Brown Sh and sltst | 820 | -606 | 249.9 | -184.7 |
| Ss and sltst | 1,010 | -796 | 307.8 | -242.6 |

**Peel Area Assessment**

| *Geologic Tops* | *FtKB* | *FtSS* | *mKB* | *mSS* |
|---|---|---|---|---|
| Tuttle | 1,090 | -876 | 332.2 | -267.0 |

## SHELL – PEEL RIVER YT B-06A

Drilling Authority Number ..... 0237
Unique Well Identifier ..... 300B066640134450
Classification ..... New Field Wildcat
Latitude ..... 66°35'09.5" Longitude ..... 134°45'40.0"
Spud Date ..... 3-Jan-67 Rig Released ..... 25-Jan-67
Status ..... Dry and Abandoned
K.B. (ft) ..... 218, 66.4 m
T.D. (ft) ..... 3,500, 1066.8 m
Logs available ..... IES, MC, BHC-S, FDC, VL
Sample Intervals (ftKB) ..... 10 - 3,500, 3.0 - 1066.8 (mKB)

***Cored Intervals***

| Interval No. | (Ftkb) | (Mkb) |
|---|---|---|
| | No Conventional core | |

***DST/RFT/EFT Tests***

| Test No. | (Ftkb) | Results | (Mkb) | Results |
|---|---|---|---|---|
| 1 | 2,619 - 2,844 | WTS in 55 min, 2,590 ft g.c.s.w. | 798.3 - 866.9 | WTS in 55 min, 789.4 m g.c.s.w. |

***Completed Intervals..... NIL***

**Schedule of Wells**

| *Geologic Tops* | *FtKB* | *FtSS* | *mKB* | *mSS* |
|---|---|---|---|---|
| Cret Sh, Sltst | surface | 218 | surface | 66.4 |
| Tuttle | 1,094 | -876 | 333.4 | -267.0 |

**Peel Area Assessment**

| *Geologic Tops* | *FtKB* | *FtSS* | *mKB* | *mSS* |
|---|---|---|---|---|
| Tuttle | 1,094 | -876 | 333.4 | -267.0 |

## ARCO SHELL SAINVILLE RIVER D-08

Drilling Authority Number ..... 0716
Unique Well Identifier ..... 300D086620133300
Classification ..... New Field Wildcat
Latitude ..... 66°17'07" Longitude ..... 133°31'39"
Spud Date ..... 09-JAN-74 Rig Released ..... 06-MAR-74
Status ..... Dry and Abandoned
K.B. (ft) ..... 666, 203.1 m
T.D. (ft) ..... 8,700, 2653.5 m
Logs available ..... DILL, CN-FD-CAL-GR, CDM
Sample Intervals (ftKB) ..... 0 - 8,700, 0 - 2653.5 (mKB)

***Cored Intervals***

| Interval No. | (Ftkb) | (Mkb) |
|---|---|---|
| 1 | 1,835 - 1893 | 559.3 - 577.0 |
| 2 | 6,955 - 6985 | 2,119.2 - 2,129.0 |

***DST/RFT/EFT Tests***

| Test No. | (Ftkb) | Results | (Mkb) | Results |
|---|---|---|---|---|
| 1 | 2,365 - 2,421 | 140 ft mud | 720.9 - 737.9 | 42.7 m mud |
| 2 | 2,027 - 2,113 | 50 ft mud | 617.8 - 644.0 | 15.2 m mud |
| 3 | 8,260 - 8,665 | 30 ft mud | 2,519.3 - 2,641.1 | 9.1 m mud |
| 4 | 3,030 - 3,043 | 60 ft mud | 924.1 - 927.5 | 18.3 m mud |
| 5 | 2,948 - 2,978 | 150 ft mud | 899.1 - 908.3 | 45.7 m mud |
| 6 | 2,850 - 2,905 | 60 ft mud | 869.2 - 885.4 | 18.3 m mud |

***Completed Intervals..... NIL***

**Schedule of Wells**

| *Geologic Tops* | *FtKB* | *FtSS* | *mKB* | *mSS* |
|---|---|---|---|---|
| Cretaceous | surface | 666 | surface | 203.1 |
| Tuttle Ss | 3,052 | -2,386 | 930.8 | -727.7 |
| Imperial | 5,482 | -4,816 | 1,672.0 | -1,468.9 |
| Canol/Hare Indian | 5,694 | -5,028 | 1,736.7 | -1,533.6 |
| Gossage Ls mbr | 6,176 | -5,510 | 1,883.6 | -1,680.5 |
| L Ls mbr | 8,052 | -7,386 | 2,455.8 | -2,252.7 |
| Ronning Group | 8,222 | -7,556 | 2,507.7 | -2,304.6 |

**Peel Area Assessment**

| *Geologic Tops* | *FtKB* | *FtSS* | *mKB* | *mSS* |
|---|---|---|---|---|
| Tuttle | 1,884 | -1,218 | 574.1 | -371.0 |
| Imperial | 3,052 | -2,386 | 930.1 | -727.0 |
| Canol | 5,483 | -4,817 | 1,671.1 | -1,468.0 |
| Bluefish | 5,679 | -5,013 | 1,731.1 | -1,528.0 |
| Hume | 5,696 | -5,030 | 1,736.1 | -1,533.0 |
| Landry | 6,175 | -5,509 | 1,882.1 | -1,679.0 |
| Arnica | 7,950 | -7,284 | 2,423.1 | -2,220.0 |
| Tatsieta | 8,052 | -7,386 | 2,454.1 | -2,251.0 |
| Peel | 8,222 | -7,556 | 2,506.1 | -2,303.0 |

## DOME TEXACO IMP SOUTH PEEL D-64

Drilling Authority Number ..... 0688
Unique Well Identifier ..... 300D64600132150
Classification ..... New Field Wildcat
Latitude ..... 65°53'04" Longitude ..... 132°27'50"
Spud Date ..... 04-APR-73 Rig Released ..... 15-MAR-74
Status ..... Dry and Abandoned
K.B. (ft) ..... 1,831, 558.1 m
T.D. (ft) ..... 6,514, 1986.8 m
Logs available ..... DILL, BHC-S, SNP, FDC
Sample Intervals (ftKB) ..... 100 - 6,514, 30.5 - 1986.8 (mKB)

***Cored Intervals***

| Interval No. | (Ftkb) | (Mkb) |
|---|---|---|
| 1 | 6,467 - 6,514 | 1,971.1 - 1,985.5 |

***DST/RFT/EFT Tests***

| Test No. | (Ftkb) | Results | (Mkb) | Results |
|---|---|---|---|---|
| 1 | 6,300 - 6,467 | 300 ft diesel | 1,921.5 - 1,971.1 | 91.4 m diesel |
| 2 | 5,540 - 5,715 | m.r. | 1,689.7 - 1,741.9 | m.r. |
| 3 | 5,540 - 5,715 | m.r. | 1,689.7 - 1,741.9 | m.r. |
| 4 | 5,540 - 5,715 | m.r. | 1,689.7 - 1,741.9 | m.r. |

***Completed Intervals*** ..... ***NIL***

**Schedule of Wells**

| *Geologic Tops* | *FtKB* | *FtSS* | *mKB* | *mSS* |
|---|---|---|---|---|
| Cretaceous | surface | 1,831 | surface | 558.1 |
| Tuttle Ss | 3,226 | -1,395 | 983.9 | -425.8 |
| Imperial | 3,580 | -1,749 | 1,091.9 | -533.8 |
| Canol/Hare Indian | 4,905 | -3,074 | 1,495.0 | -936.9 |
| Hume | 5,119 | -3,288 | 1,560.3 | -1,002.2 |
| Gossage Ls mbr | 5,586 | -3,755 | 1,703.7 | -1,145.6 |

**Peel Area Assessment**

| *Geologic Tops* | *FtKB* | *FtSS* | *mKB* | *mSS* |
|---|---|---|---|---|
| Tuttle | 3,225 | -1,394 | 983.1 | -425.0 |
| Imperial | 3,580 | -1,749 | 1,091.1 | -533.0 |
| Canol | 4,905 | -3,074 | 1,495.1 | -937.0 |
| Bluefish | 5,099 | -3,268 | 1,554.1 | -996.0 |
| Hume | 5,118 | -3,287 | 1,560.1 | -1,002.0 |
| Landry | 5,588 | -3,757 | 1,703.1 | -1,145.0 |

## ATLANTIC ET AL. ONTARATUE H-34

Drilling Authority Number ..... 0122
Unique Well Identifier ..... 300H346630132000
Classification ..... New Field Wildcat
Latitude ..... 66°23'22.5" Longitude ..... 132°05'51.5"
Spud Date ..... 20-DEC-63 Rig Released ..... 01-APR-64
Status ..... Dry and Abandoned
K.B. (ft) ..... 465, 141.7 m
T.D. (ft) ..... 13,370, 4075.2 m
Logs available ..... IES, MC, DIP, SGR-C, ML, LL, FD, VL
Sample Intervals (ftKB) ..... 0 - 13,370, 0 - 4075.2 (mKB)

***Cored Intervals***

| Interval No. | (Ftkb) | (Mkb) |
|---|---|---|
| 1 | 4,495 - 4,555 | 1,370.1 - 1,388.4 |
| 2 | 9,480 - 9,499 | 2,891.4 - 2,895.3 |
| 3 | 10,004 - 10,023 | 3,049.2 - 3,055.0 |
| 4 | 10,603 - 10,632 | 3,231.8 - 3,240.6 |
| 5 | 11,348 - 11,351 | 3,458.9 - 3,459.8 |

***DST/RFT/EFT Tests***

| Test No. | (Ftkb) | Results | (Mkb) | Results |
|---|---|---|---|---|
| 1 | 1,164 - 1,271 | 15 ft mud | 355.0 - 387.4 | 4.6 m mud |
| 2 | 4,432 - 4,460 | 180 ft g.c. mud, and 550 ft gcsw | 1,351.7 - 1,360.3 | 54.9 m g.c. mud, 167.7 m gcsw |

***Completed Intervals..... NIL***

**Schedule of Wells**

| *Geologic Tops* | *FtKB* | *FtSS* | *mKB* | *mSS* |
|---|---|---|---|---|
| Imperial | 852 | -387 | 259.7 | -118.0 |
| Canol/Hare Indian | 2,907 | -2,442 | 886.1 | -744.4 |
| Hume | 3,229 | -2,764 | 984.2 | -842.5 |
| Gossage | 3,618 | -3,153 | 1,102.8 | -961.1 |
| L Ls mbr | 5,246 | -4,781 | 1,599.0 | -1,457.3 |
| Ronning Group | 5,472 | -5,007 | 1,667.9 | -1,526.2 |
| Mount Kindle | 6,248 | -5,783 | 1,904.4 | -1,762.7 |
| Franklin Mt | 6,903 | -6,438 | 2,104.0 | -1,962.3 |
| Macdougal Group | 9,462 | -8,997 | 2,884.0 | -2,742.3 |
| Saline River | 9,462 | -8,997 | 2,884.0 | -2,742.3 |
| Mount Cap | 9,591 | -9,126 | 2,923.3 | -2,781.6 |
| Mount Clark | 9,902 | -9,437 | 3,018.1 | -2,876.4 |
| Proterozoic | 10,204 | -9,739 | 3,110.2 | -2,968.5 |

**Peel Area Assessment**

| *Geologic Tops* | *FtKB* | *FtSS* | *mKB* | *mSS* |
|---|---|---|---|---|
| Tuttle | ABS | ABS | ABS | ABS |
| Imperial | 852 | -387 | 259.7 | -118.0 |
| Canol | 2,906 | -2,441 | 885.7 | -744.0 |
| Bluefish | 3,188 | -2,723 | 971.7 | -830.0 |
| Hume | 3,227 | -2,762 | 983.7 | -842.0 |
| Landry | 3,618 | -3,153 | 1,102.7 | -961.0 |
| Arnica | 4,999 | -4,534 | 1,523.7 | -1,382.0 |
| Tatsieta | 5,245 | -4,780 | 1,598.7 | -1,457.0 |
| Peel | 5,471 | -5,006 | 1,667.7 | -1,526.0 |
| Mt Kindle | 6,249 | -5,784 | 1,904.7 | -1,763.0 |
| Franklin Mtn | 6,902 | -6,437 | 2,103.7 | -1,962.0 |
| Cherty | 7,099 | -6,634 | 2,163.7 | -2,022.0 |
| Uclas | 9,461 | -8,996 | 2,883.7 | -2,742.0 |
| Mt Cap | 9,592 | -9,127 | 2,923.7 | -2,782.0 |
| Mt Clark | 9,901 | -9,436 | 3,017.7 | -2,876.0 |
| Proterozoic | 10,202 | -9,737 | 3,109.7 | -2,968.0 |

## IOE TREE RIVER H-38

Drilling Authority Number ..... 0260
Unique Well Identifier ..... 300H386720132150
Classification ..... New Field Wildcat
Latitude ..... 67°17'21" Longitude ..... 132°21'00"
Spud Date ..... 19-MAR-67 Rig Released ..... 23-APR-67
Status ..... Dry and Abandoned
K.B. (ft) ..... 261, 79.6 m
T.D. (ft) ..... 4,197, 1279.2 m
Logs available ..... IES, MC, VL, BHC-S-GRC
Sample Intervals (ftKB) ..... 280 - 4,197, 85.4 - 1279.2 (mKB)

***Cored Intervals***

| Interval No. | (Ftkb) | (Mkb) |
|---|---|---|
| 1 | 2,606 - 2,636 | 794.8 - 803.9 |
| 2 | 2,860 - 2,890 | 872.3 - 881.4 |
| 3 | 3,758 - 3,778 | 1,146.1 - 1,152.3 |

***DST/RFT/EFT Tests***

| Test No. | (Ftkb) | Results | (Mkb) | Results |
|---|---|---|---|---|
| | None | | None | |

***Completed Intervals..... NIL***

**Schedule of Wells**

| *Geologic Tops* | *FtKB* | *FtSS* | *mKB* | *mSS* |
|---|---|---|---|---|
| Imperial | surface | 261 | surface | 79.6 |
| Canol/Hare Indian | 2,346 | -2,085 | 715.1 | -635.5 |
| Hume | 2,550 | -2,289 | 777.2 | -697.6 |
| Gossage | 2,637 | -2,376 | 803.8 | -724.2 |

**Peel Area Assessment**

| *Geologic Tops* | *FtKB* | *FtSS* | *mKB* | *mSS* |
|---|---|---|---|---|
| Tuttle | ABS | ABS | ABS | ABS |
| Imperial | 271 | -10 | 82.6 | -3.0 |
| Canol | 2,348 | -2,087 | 715.6 | -636.0 |
| Bluefish | ABS | ABS | ABS | ABS |
| Hume | 2,551 | -2,290 | 777.6 | -698.0 |
| Landry | 2,636 | -2,375 | 803.6 | -724.0 |
| Arnica | 3,450 | -3,189 | 1,051.6 | -972.0 |

## UNION AMOCO McPHERSON B-25

Drilling Authority Number ..... 545
Unique Well Identifier ..... 300B256720135300
Classification ..... New Field Wildcat
Latitude ..... 67°14'00.78" Longitude ..... 135°34'22.37"
Spud Date ..... 8-Jan-72 Rig Released ..... 12-Mar-73
Status ..... Dry and Abandoned
K.B. (ft) ..... 1,615, 492.3 m
T.D. (ft) ..... 13,570, 4136.1 m
Logs available ..... IES, MC, BHC-S, FDC, VL
Sample Intervals (ftKB) ..... 20 -13,570, 6.1 - 4136.1 (mKB)

***Cored Intervals***

| Interval No. | (Ftkb) | (Mkb) |
|---|---|---|
| | No Conventional core | |

***DST/RFT/EFT Tests***

| Test No. | (Ftkb) | Results | (Mkb) | Results |
|---|---|---|---|---|
| 1 | 13,175 - 13,080 | m.r. | 4,015.7 - 3,986.8 | m.r. |
| 2 | 13,200 - 13,112 | m.r. | 4,023.4 - 3,996.5 | m.r. |
| 3 | 13,570 - 8,710 | m.r., 600 ft mud | 4,136.1 - 2,656.5 | m.r., 183.0 m mud |
| 4 | 13,570 - 8,710 | m.r., 480 ft mud | 4,136.1 - 2,656.5 | m.r., 146.4 m mud |

***Completed Intervals*** ..... ***NIL***

**Schedule of Wells**

| *Geologic Tops* | *FtKB* | *FtSS* | *mKB* | *mSS* |
|---|---|---|---|---|
| Tuttle Ss | 270 | 1,345 | 6.1 | 486.2 |
| Imperial | 3,364 | -1,749 | 1,026.0 | -533.7 |
| Canol/Hare Indian | 9,626 | -8,011 | 2,934.0 | -2,441.7 |
| Hume | 9,716 | -8,101 | 2,963.3 | -2,471.0 |
| Gossage | 9,976 | -8,361 | 3,042.6 | -2,550.3 |
| L Ls mbr | 11,091 | -9,476 | 3,380.5 | -2,888.2 |
| Ronning Group | 11,631 | -10,016 | 3,545.1 | -3,052.8 |
| Mount Kindle | 12,903 | -11,288 | 3,932.8 | -3,440.5 |
| Franklin Mt | 13,100 | -11,485 | 3,992.9 | -3,500.6 |

**Peel Area Assessment**

| *Geologic Tops* | *FtKB* | *FtSS* | *mKB* | *mSS* |
|---|---|---|---|---|
| Tuttle | 270 | 1,345 | 82.3 | 410.0 |
| Imperial | 3,364 | -1,749 | 1,025.3 | -533.0 |
| Canol | 9,627 | -8,012 | 2,934.3 | -2,442.0 |
| Bluefish | 9,709 | -8,094 | 2,959.3 | -2,467.0 |
| Hume | 9,716 | -8,101 | 2,961.3 | -2,469.0 |
| Landry | 9,975 | -8,360 | 3,040.3 | -2,548.0 |
| Arnica | ABS | ABS | ABS | ABS |
| Tatsieta | 11,090 | -9,475 | 3,380.3 | -2,888.0 |
| Peel | 11,632 | -10,017 | 3,545.3 | -3,053.0 |
| Mt Kindle | 12,905 | -11,290 | 3,933.3 | -3,441.0 |
| Franklin Mtn | 13,101 | -11,486 | 3,993.3 | -3,501.0 |
| Cherty | 13,101 | -11,486 | 3,993.3 | -3,501.0 |

PEEL YT H-71

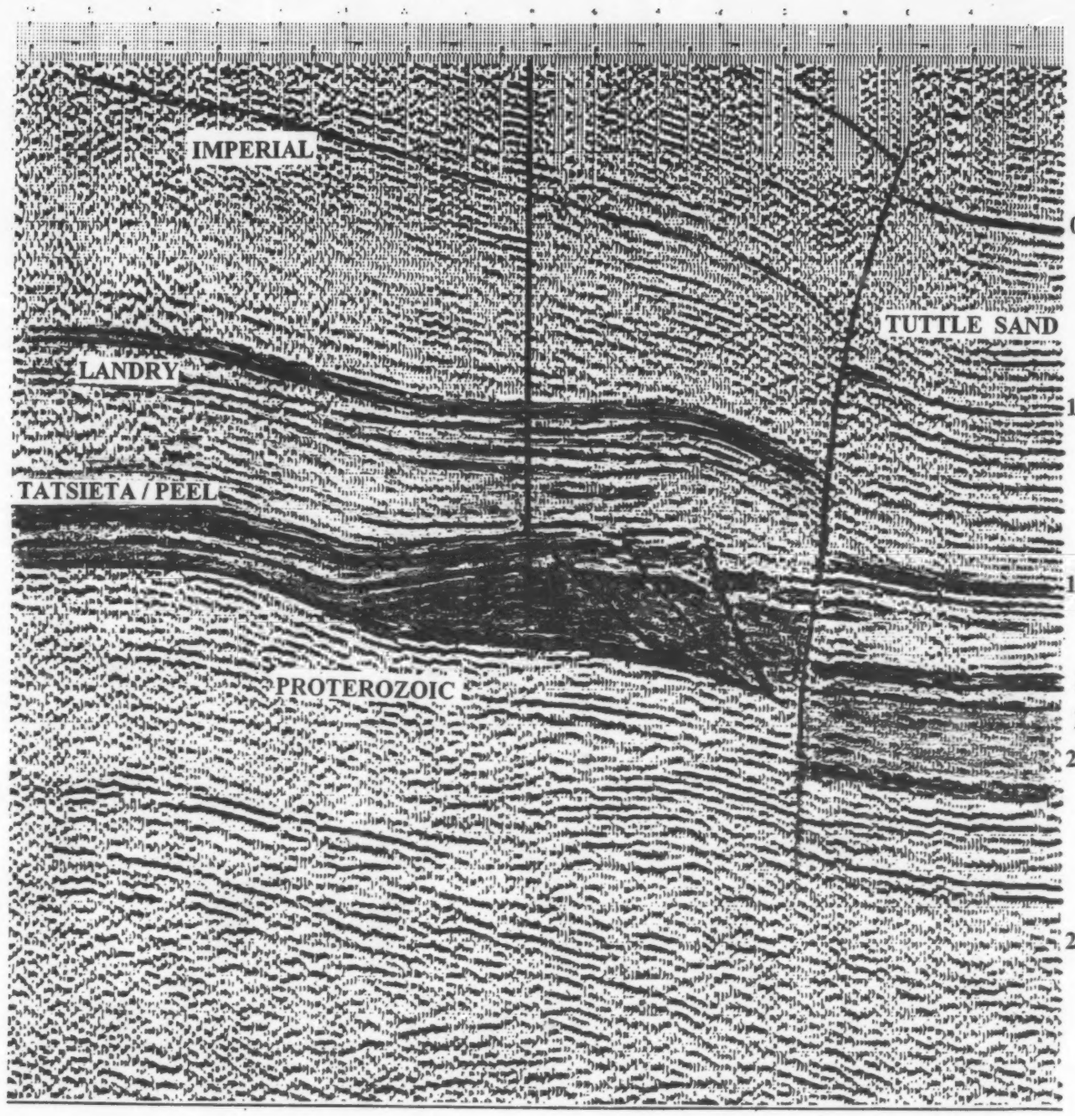


**Figure 8b. Seismic line 5J-30. Mobil 1976**
**Interpretation NEB**

PEEL RIVER YT I-21
5 km north

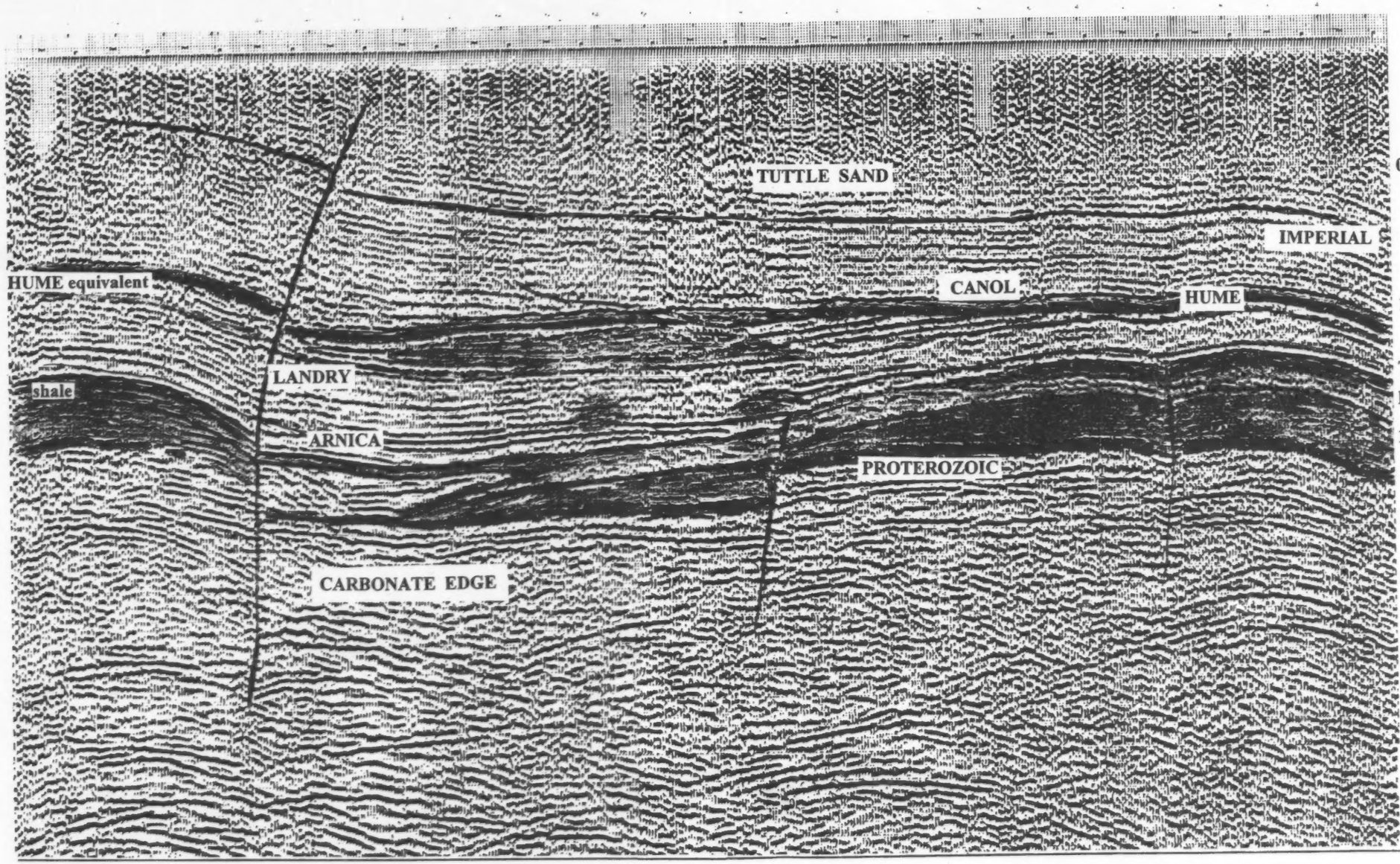


Figure 8c. Seismic line 5J-32. Mobil 1976
Interpretation NEB